Volume 11, No. 1 **January, 1956**

The Soil Conservation Program in the Sixth Naval District
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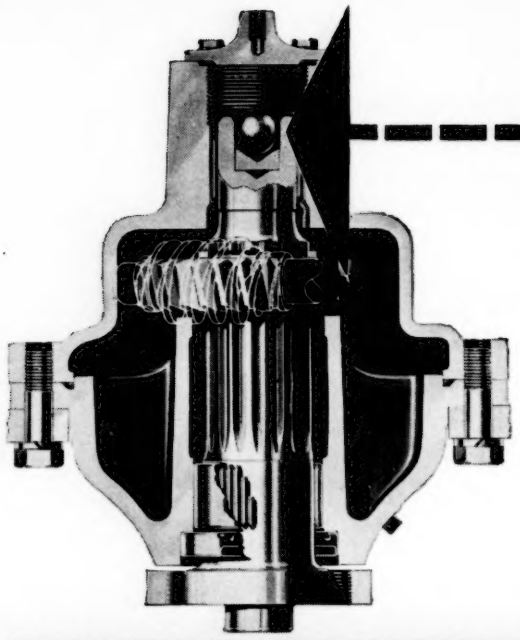
How We Do Extension Work In Soil Conservation
. . . H. WENDELL TASCHER AND OTHERS

Nebraska Soil Monolith Factory
. . . HERBERT T. KOLLMORGEN

Earth Slips in the Allegheny Plateau Region
. . . J. BOYD PATTON

Book Reviews: Life and Death of the Soil; Forestry and Related Research in North America; and Floods.



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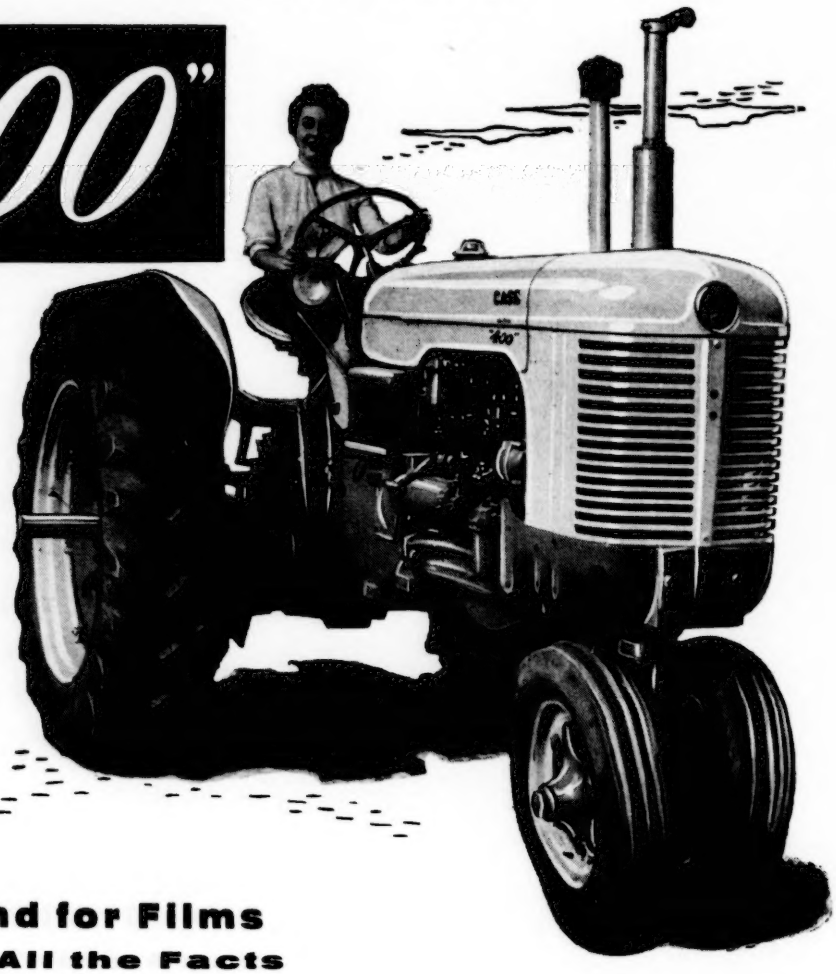

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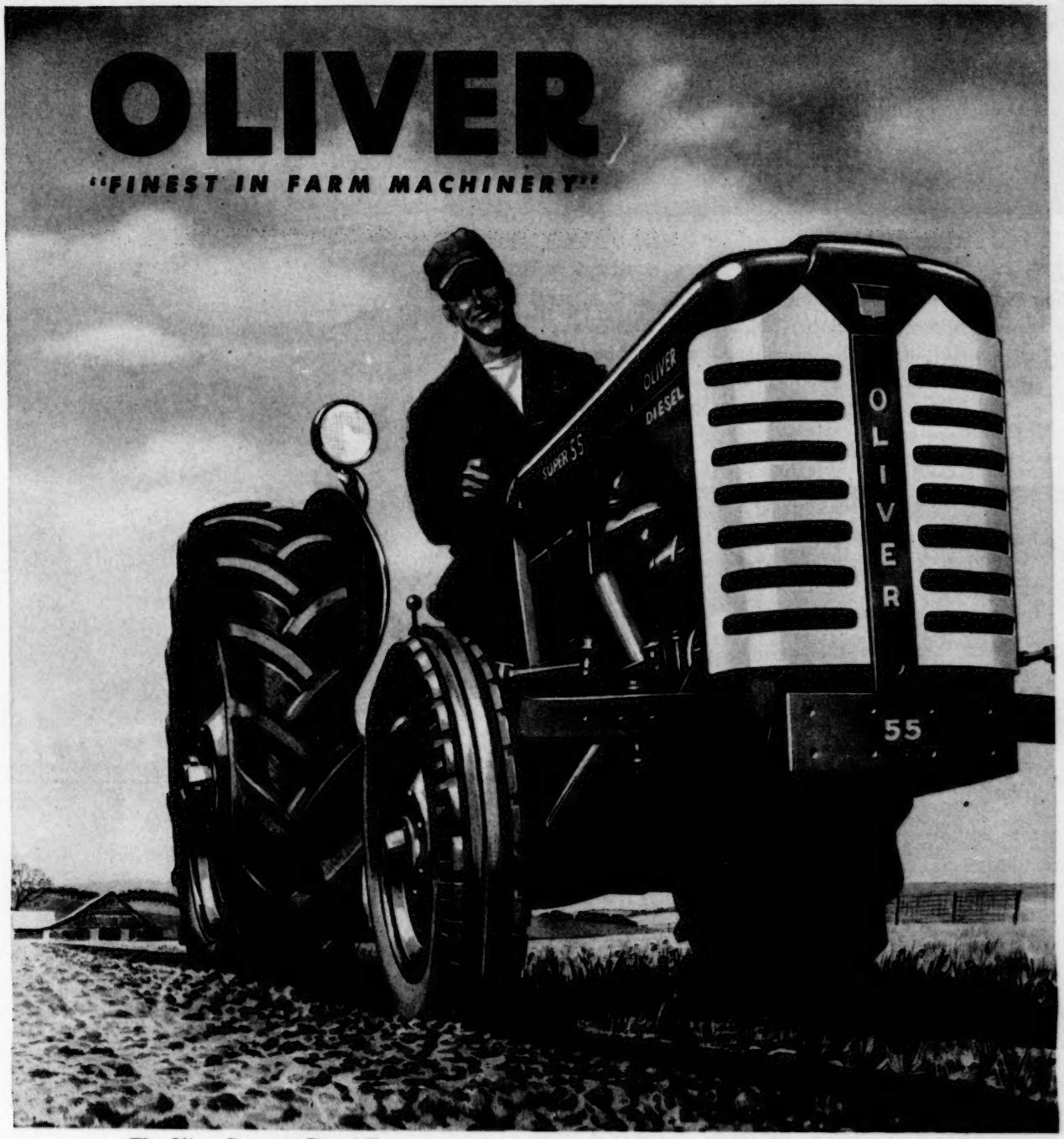

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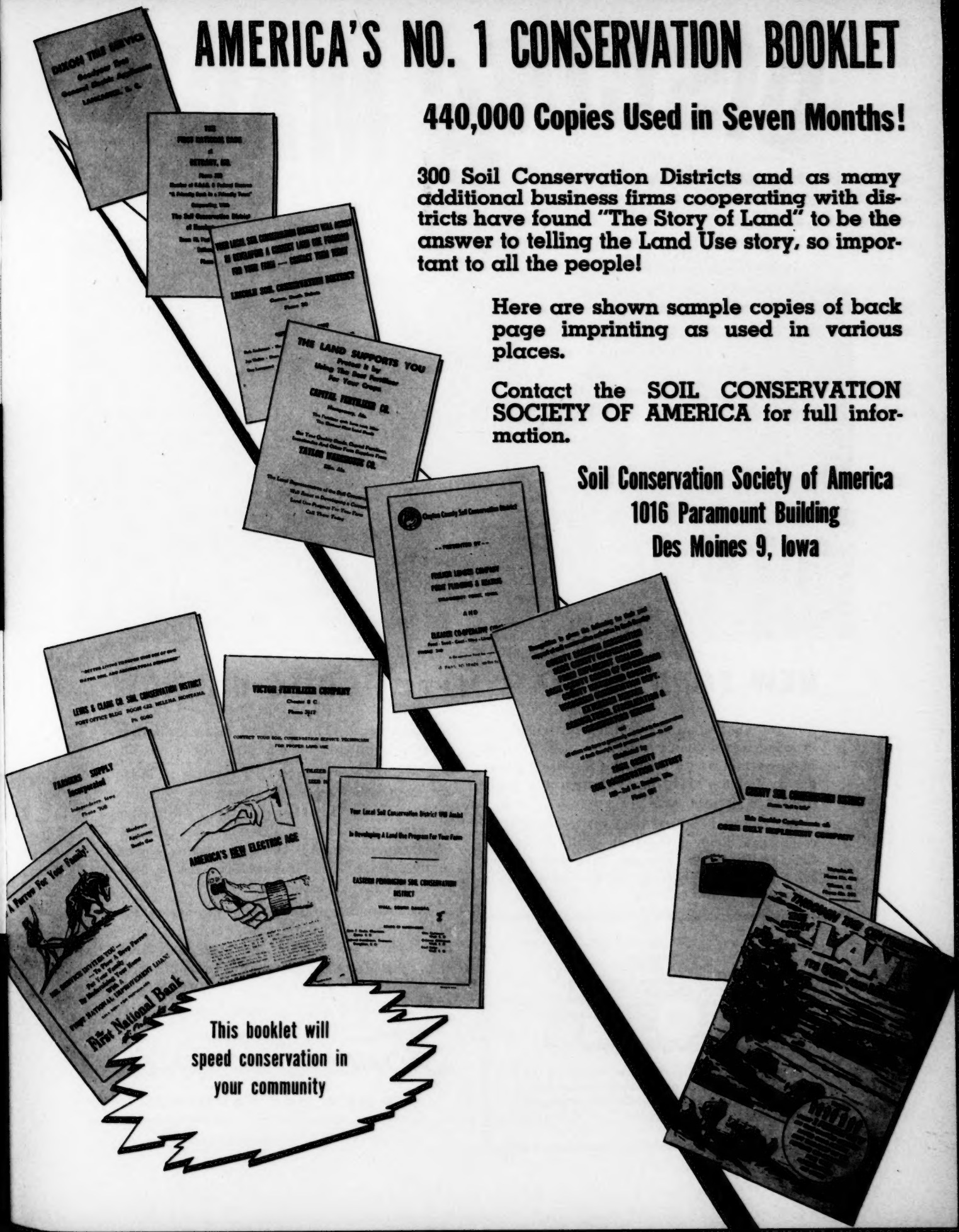
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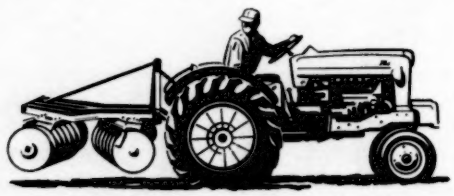

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VOLUME 11
NUMBER 1

Journal of SOIL AND WATER CONSERVATION

TO ADVANCE THE SCIENCE AND ART OF GOOD LAND USE

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Cover: Personnel representing the Forest Service and the Bureau of Reclamation sampling snow at the Bureau of Reclamation's snow storage gage in the West St. Louis Creek Watershed, Colorado.
—Photo Courtesy U. S. Forest Service

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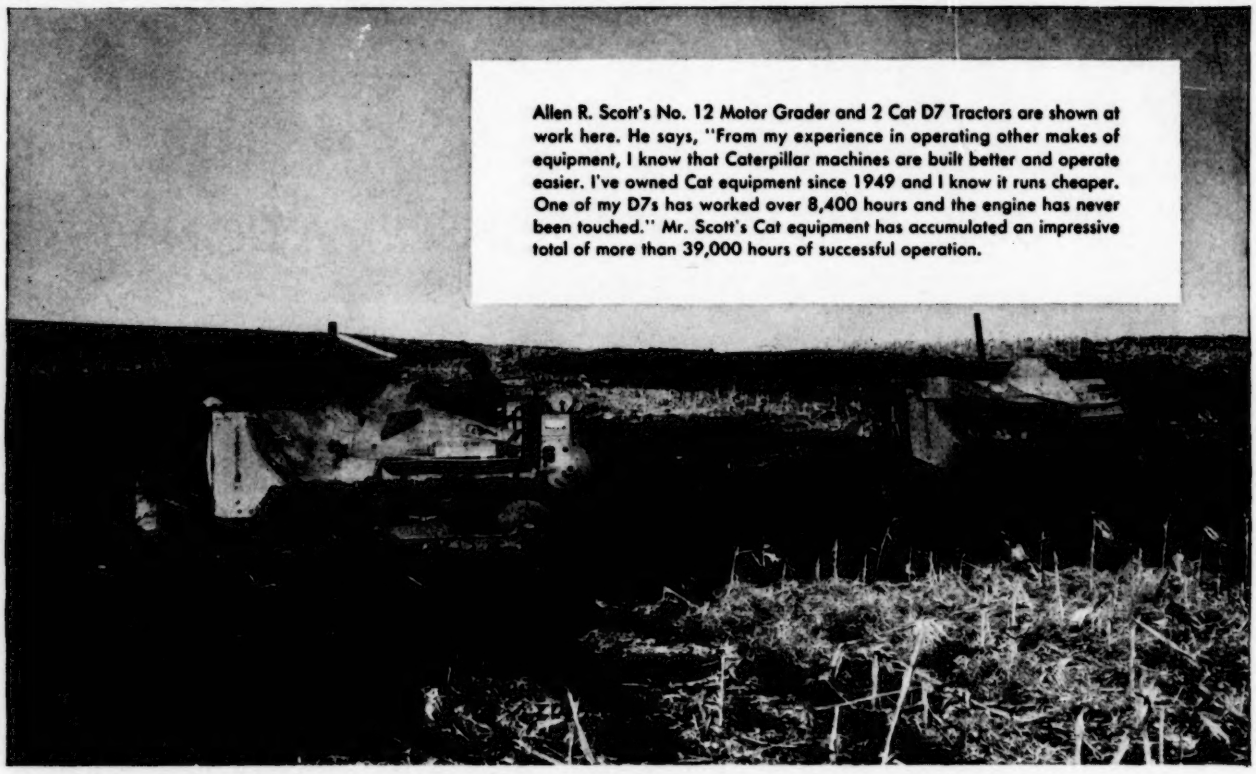

Allen R. Scott's No. 12 Motor Grader and 2 Cat D7 Tractors are shown at work here. He says, "From my experience in operating other makes of equipment, I know that Caterpillar machines are built better and operate easier. I've owned Cat equipment since 1949 and I know it runs cheaper. One of my D7s has worked over 8,400 hours and the engine has never been touched." Mr. Scott's Cat equipment has accumulated an impressive total of more than 39,000 hours of successful operation.

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Terraces and ponds built with farmer-owned equipment that may be too small to efficiently move dirt, are a discouraging business for both S.C.S. representative and farmer, and the program is too often discontinued, or the structure done inadequately.

The key is the farm power contractor—for example, the well-equipped spread of Allen Scott, Hickman, Nebraska, is shown here. His CAT* track-type Tractors can do a *complete* land forming and development job: filling in gullies, building waterways, ponds and dams. His Cat Motor Grader is the most efficient machine for building the type of terraces needed here. Such terraces stand up—they are brought to accurate grade, and the dirt can be moved as far as necessary without creating low spots that are difficult for farm machinery to work through.

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Extension's Opportuity in Resource Use Programs

WALTER C. GUMBEL

Conservation problems are largely human problems. Consequently, we find ourselves, at times, enmeshed in an elastic net in which pressure or change at one point is reflected at all other points. In this way conservation becomes a matter of our total culture—in the broadest sense of the term. We are now at the place where our educational processes must take on a more dynamic and a more realistic approach in helping all people provide for and solve their local, regional, state and national resource problems.

ABRAHAM LINCOLN, in his Gettysburg Address said, "It is for us the Living . . . to be dedicated here to the Unfinished work . . ." I know of no other statement that describes so aptly the challenges with which we are confronted in the use and care of the land and its related resources. America is deeply rooted in the land. Its democratic form of government, its economic and social systems, its agricultural and industrial might, its individual freedom and opportunity for expression are all products of the soil. It is for us, the present, who have inherited the richness of the land, to guard it against depletion and mis-use and further secure it for our children and their children in the decades ahead.

Sometime ago I received a statement from a large eastern investment house which contained the forecasts, made by executives representing 26 major manufacturing enterprises, of the essential character of America two decades hence. These men forecast that Americans in 1975 will work six fewer hours each week and be paid 25 per cent more for their labors. Week-end drivers will find the "open road" crowded with 80 million passenger cars in contrast to today's 50 million. The Nation's population will hit an all-time high peak of 213 million people. Employment will increase from 1955's 65 million to a record of 85 million. There will be at least 92 million TV sets, 90 per cent of which will be color. And material welfare will cease to be a problem, for the first time in man's history. These predictions, to say the least, are not only amazing but probable.

Now let us for a moment turn to the unprecedented agricultural and social revolution taking place in rural America. The American farm worker, we are told, is today 110 per cent more productive than he was 25 years ago. This means that 37 per cent fewer farm workers, putting in less hours, are producing 54 per cent more than was produced 25 years ago. Only 13.5 per cent of the Nation's population, compared to 25 per cent in 1930, now lives on the land. In the next 25 years, farm production will rise 39 per cent. Yet the total number of farms and ranches will decrease from 5.3 million to approximately 4.3 million; farm population from 21.9 million to 17 million, or from 13.5 per cent to only eight per cent of the total U.S. population. To put all this another way, the probabilities are that farm production in 1975 will have more than doubled since 1930, while farm population will have declined by nearly a half.

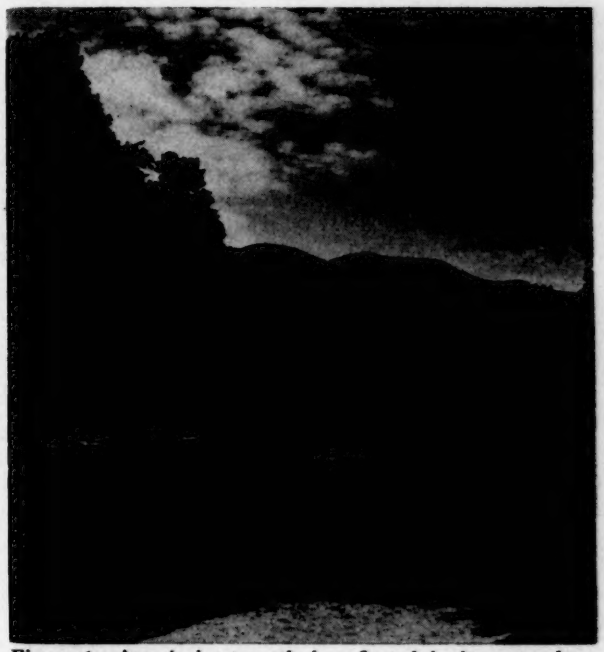


Figure 1. America's strength is reflected in its natural resources. Water—its production and wise use is a local problem and concerns both rural and urban interests.

Technology and Resources

Since agriculture plays such an important role in the nation's economy, this narrowing process obviously will place greater responsibility on those who remain in farming and ranching. Herein, then, lies the challenge and the opportunity for Extension and technicians in other fields to help the nation meet its physical and human resource needs.

The building of a strong and healthy agricultural economy is of primary concern to the land owner. However,

This paper by Walter C. Gumbel was presented at the Michigan State University Annual Agricultural Extension Service Conference held at East Lansing on October 25, 1955. Mr. Gumbel is conservationist for the Monongahela Power Company and editor of the JOURNAL OF SOIL AND WATER CONSERVATION. *His headquarters are in Fairmont, West Virginia.*

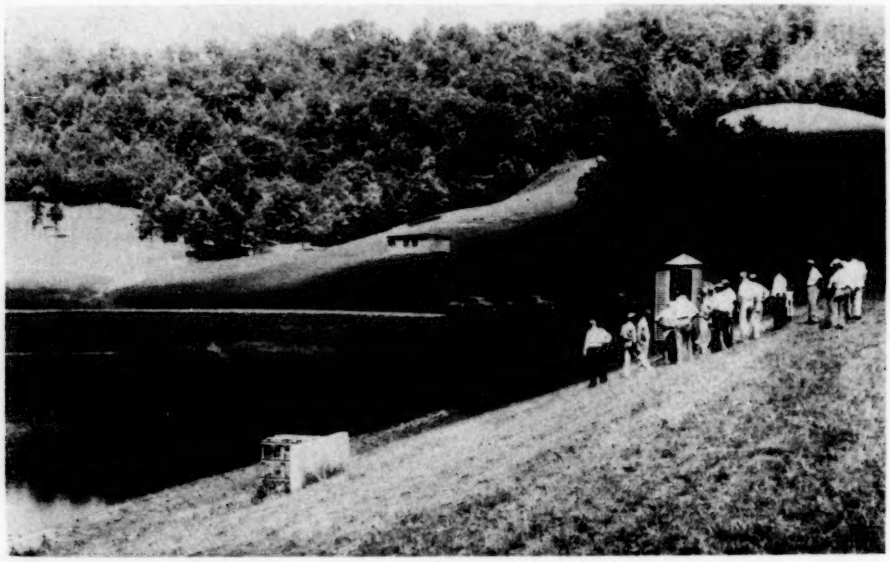


Figure 2. This community watershed group surveys a flood water detention reservoir. Local leadership and participation is extremely important if watershed projects are to succeed.

business and industrial interests, the professional man and those who live in America's villages, towns and cities also have much at stake. For example, the limits of our great industrial system and our standard of living are invariably set by the available food supply which takes about 26 cents out of each spendable dollar. This leaves a balance of 74 cents to be spent for manufactured products, professional services and recreation. It would be impossible to maintain this standard without an ample supply of food at reasonable prices, a condition associated with fertile land.

The question is often asked, "Can we meet the resource needs of the Nation a hundred years from now?" My answer is "Yes." *We already know that farm production could be increased 60 per cent over what it is now if the best combination of land use and management practices were applied on all farms.* In the years ahead, we will see additional progress in technology covering not only farm production in all its aspects, but also those resource requirements that have common usage by other segments of our population. As long as technology in research and education keeps ahead of population growth, and our resources are used wisely, we need not be too greatly concerned with future resource requirements.

When the Land Grant College system was set up in 1865, agriculture was the dominant industry in the Nation. This also applied to the early days of the Extension Service. Programs in both research and education were geared to the needs of the day. Research during the intervening years has steadily moved forward and kept pace with current resource problems and needs. However, it is interesting to note that during 1953, the United States Department of Agriculture and the state experiment stations spent a total of 118 million dollars on research. During the same year, industry spent an additional 140 million dollars on agricultural research projects.

Educational programs have also been effective. However, we now know that resources required by agriculture or a particular industry, are inter-related. We know, too, that conservation problems are largely human problems. Consequently, we find ourselves, at times, enmeshed in an elastic net in which pressure or change at one point is reflected at all other points. In this way conservation becomes a matter of our total culture—in the broadest sense of the term. *We are now at the place where our educational processes must take on a more dynamic and a more realistic approach in helping all people provide for and solve their local, regional, state and national resource problems.*

Resource Problems Are Far Reaching

To provide the resource needs of a growing population, the American farmer is today confronted with a multitude of new problems and situations. Some are rural in character while others embrace both rural and urban interests. For example, good farm land in the nation is being lost at the rate of approximately two million acres per year to housing developments, industrial plants, highways, airports and other public and private uses.

Land owners will be expected to produce more food, provide more raw materials for industry, cooperate with water producing programs sponsored by urban and industrial centers, expand hunting and fishing facilities and other forms of outdoor recreation. They will also be concerned with shifts in the production of crops as well as acreage allotments and control programs. Other important resource problems include soil depletion, human nutrition, floods, droughts . . . the question of water rights, part-time and residential farming; also woodland management and forest fire prevention.

These situations and demands are certainly in sharp contrast with the programs set forth during the early days of the Extension Service and the Land Grant Colleges. Their recognition and development concerns Extension workers everywhere and can be grouped under five major objectives.

1. *Human resource conservation.* Individuals need to be provided with the opportunity to choose freely among alternatives that lead to better health and longer life, improved education and understanding, and ethical and aesthetic appreciation . . . all of which give meaning to human existence.
2. *Resource use education.* This is an area of extreme importance. Everyone should thoroughly understand the place of resources in the Nation's total economy; also something about the practices required for their wise utilization. Educational techniques, including the press, radio, television, lectures, demonstrations and other means need to be fully utilized. Children in our public schools should be given the opportunity to become familiar with the importance of the resources.
3. *Land use determination—including ownership.* We need to inventory all land resources . . . county by county and state by state, recognizing total capability, types of farming, economic classes, and other physical and social factors. Consideration must also be given to the kinds of land that should be in public or private ownership . . . and under what conditions.
4. *Planning land-use resources.* This concerns the individual land owner . . . it also involves communities, regions, the state and the nation on a cooperative basis. This is where resource problems are delineated . . . watershed by watershed, needs determined and uses established by agricultural, urban, industrial and recreational interests.
5. *Resource cooperation and control.* The maximum participation between private and public agencies is of utmost importance . . . perhaps with the emphasis on "partnership." We need to determine the responsibilities and rights, legal or otherwise, of cooperators and cooperating agencies at all levels. Do we need a state water and land policy? To what extent should controls such as rural zoning, timber cutting, sustained vegetation . . . be considered? Are additional local, state and Federal funds needed to get the job done?

The total resource requirements of a state must reflect the needs of agricultural, industrial, business and recreational interests. There should be no conflict. For example, the construction of a large flood control reservoir in a fertile valley could upset the entire agricultural economy as well as nearby business enterprises. By the same token, such a structure could also result in the development of a profitable recreation program. On the other hand, the protection of downstream urban and industrial property from floods could easily off-set the total loss to agriculture. This is why we need to consider all the resource needs of an area in our planning and at the same time look ahead as far as possible.

Resource Skills Are Needed

Resource use planning requires certain skills . . . skills which recognize, for example, ecological, engineering, agronomic, human and other relationships. This is a new field in which a limited number of men are now being trained at only two or three leading universities. The demand for men capable of filling responsible resource use planning positions in various parts of the country far exceeds the supply. This does not preclude the fact that there are many qualified men in the field who have grown up with the movement. They are to be found in state and Federal conservation agencies, in the Extension Service, the Land Grant Colleges and in industry. The progress we have made as a Nation is a tribute to their foresight and leadership.

Where does Extension fit in the resource use program? This question has been asked many times. C. M. Ferguson, Administrator of the Federal Extension Service, writing in a recent issue of the JOURNAL OF SOIL AND WATER CONSERVATION had this to say:

"The job of Extension is to organize and relate its educational work to the work of others. Perhaps in no other area of agricultural programs is there a better opportunity for teamwork. County extension workers have experienced conservationists to help them. Representatives of other agencies have the resources of Extension as an educational organization to help farmers un-

Figure 3. Farm woodlots are an important source of lumber and should be considered a farm enterprise. Their management requires understanding and initiative.

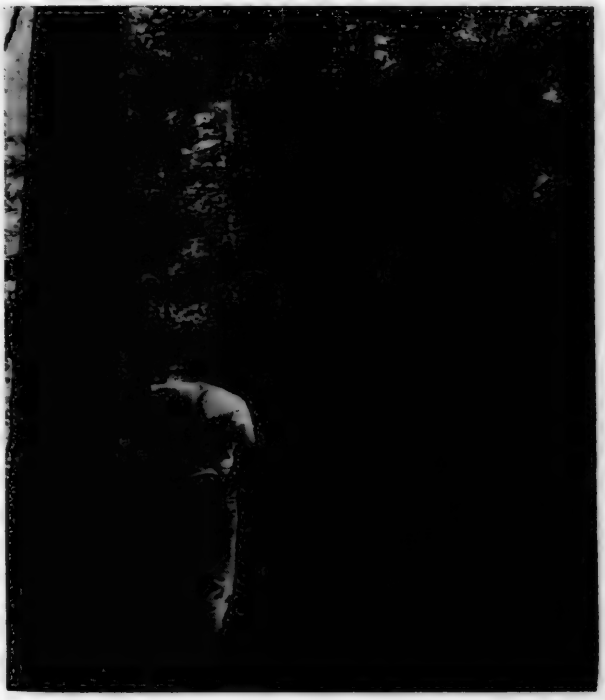


Figure 4. *Left:* A group of Four-H Club members learning how to judge land. *Right:* A land owner discusses his conservation farm plan with the local work unit conservationist.

derstand and use their assistance. Anything less than close cooperation is not to the best interests of the people. This calls for the closest possible working partnership of local, state and National agencies, soil conservation districts, conservation groups, farm organizations, watershed associations, and business, industrial, civic, educational, and other groups."

This statement emphasizes the need for leadership, for understanding, and for teamwork in conservation education by the Extension Service. It also points out that this work is to be done in cooperation with all resource agencies and other resource groups. The statement further implies that the initiative for planning and developing such a program must be taken by the county agent or his counterpart at the state level. These principles have not always been followed. Consequently, there have been some assertions of conflict. There may be differences, to be sure—but there should not be conflict. I have little patience with those who make big issues out of small differences.

It is my belief, and with this some may differ, that the Extension Service should broaden its concept to include leadership, through state and local groups, in general resource planning and program correlation. I am not thinking of technical or action programs. This is the responsibility of other state and Federal resource agencies. A need now exists in many sections of the country to advise and provide background information to people, both rural and urban, regarding new resource developments and programs of a local or regional character. These proposals are often inspired by some particular individual concerned with a specific problem. Other resources may often be affected in one way or another. Would it not create less confusion and doubt if the particular resource objective and the methods of attaining it were carefully discussed and worked out in advance by everyone concerned? The answer is obvious. This, at least in part, is usually done by some responsible state planning or semi-public development group. *Where none exists, the public leadership must be assumed by a well informed person such as the county or state Extension worker with the advice and counsel of other local resource technicians. Men and women in these positions must have a thorough knowledge of the job. Their training must go far beyond a B.S. degree with a major, for example, in animal husbandry, forestry, agronomy or home economics. Instead, they must have a knowledge of the inter-relationship of resources to all phases of agriculture . . . especially as problems and needs are represented by rural and urban groups. The day of the "enterprise" trained county agent, supervisor or administrator is behind us.*

Resource-use programs cannot be attained unless the farmer or the entire community can be shown that they are economically profitable. This reasoning also applies to all other types of land-use projects, for it is income which determines our American standard of living.

The landowner must be convinced that conservation pays. There is no other alternative. He needs technical help in the selection of suitable measures required to control water and wind erosion, the depletion of soil fertility, inadequate drainage; also help for the production of water, forest fire prevention, reforestation, woodland, wildlife and other resource management measures. The adop-

tion of these practices alone will not always insure sufficient income on all farms. Some may be too small or too inefficient. Others may require additional labor, capital or credit. It is extremely important, however, that land use and conservation practices be considered not as something separate, but rather as an integral part of the entire farm operation. This also includes the farm home. Both must be given proper consideration in their economic and social relationship to each other. All this is helpful in our efforts to improve farm income and better family living. Every Extension worker, and every conservation technician as well as others working on resource use programs, must thoroughly understand the importance of these requirements.

—Photo Courtesy Allis-Chalmers Mfg. Co.

Figure 5. This farm family is deeply rooted in the land. The soil is productive and is well protected against the elements. Good management practices are also in effect. Through Four-H Clubs, method and result demonstrations, home makers clubs and other extension techniques, rural America will continue to meet its resource responsibilities.

Planning and Organization Are Important

All this suggests careful planning and organization by the Extension worker—not only at the county, but also at the state level. Other resource agencies should be invited to cooperate in order that the best possible use can be made of their technical skills. These skills, along with Extension's educational techniques, help to round out the requirements of a strong program.

This suggests another important requirement: Under no circumstances should the leadership in this work be assumed by the Extension Agent alone. The home agent, the 4-H Club agent and others in the county office also have important responsibilities. They, too, are constantly working on problems and with groups that are either directly or indirectly related to resources. The staff must operate as a team.

The direction and approval to a county-wide extension conservation education program is given by local program planning committees which often include supervisors of soil conservation districts. Technical assistance programs on the other hand are handled through districts and other resource leaders. Some resource programs such as flood control and prevention, forestry and wildlife may also be directed through districts. A few, on the other hand, may operate independently. Educational activities, however, are needed to establish all types of resource programs. Close coordination, therefore, between these groups and the Extension Service is of utmost importance.

In planning and developing a county extension conservation education program, consideration should be given to two resource use areas. These are:

1. *Expansion of resource use programs on agricultural lands.* This involves the individual farm family as owner, tenant or part-time farmer. It also covers the motivation of interest, planning, application and maintenance of needed conservation and farm management practices.
2. *Resource programs that are broad in scope.* Included in this area are those activities that concern urban and industrial expansion, flood control and prevention, development of wildlife refugees, abatement of soil and other forms of pollution in streams, provision for the expansion of outdoor recreational facilities, stream-flow stabilization, water supplies for urban and industrial needs and others. This coordinated approach can best be achieved on a watershed basis.

An analysis of these two areas of activity suggests that a county-wide resource use program must be based on fact. It also suggests an inventory of all land, timber and wildlife resources, available and required water needs, urban and industrial expansion plans, recreation needs and a host of others. This must be done in an orderly manner—perhaps under the guidance and direction of a skilled resource leader from the state level. Once these determinations are made with the help of

local resource committees representing rural and urban interests, then the appropriate conservation education activities can easily be set up and scheduled.

Selecting Educational Activities

The selection of suitable educational techniques should be given careful consideration. Industry has done much in this field and might well be considered as a source of challenging material. We must keep in mind that our modern system of communications, entertainment and other social influences has almost eliminated "community meetings." Other and more effective means of reaching people must be found. There are, however, some activities which are still important. Some of these, without discussion, are:

1. Leadership training schools embracing the various phases of the total county resource use program.
2. Cooperation with vocational agriculture teachers and the public school system by providing information on local resource problems and needs.
3. Demonstrations and tours giving emphasis to conservation problems and practices.
4. Making resource use information available to the public through the press, radio, television, and other means.
5. Working through and assisting watershed districts and associations, resource committees, neighborhood and community groups.
6. Holding conservation contests such as land judging; also arranging exhibits.
7. Assisting rural and urban youth groups to carry out and become more familiar with all phases of resource use programs.
8. Cooperation with women's groups—both rural and urban.
9. Rendering educational assistance to local, state and Federal agencies having resource responsibilities. This would include soil conservation districts and other quasi-public groups; also farm, civic, industrial and professional organizations that have a stake in conservation.

All this may appear somewhat involved. Actually it isn't. The local extension worker is in a key position and as such he needs to be thoroughly conversant with the general resource needs of his area. He may obtain assistance from many skilled and trained persons to help develop and plan his county-wide resource program. These persons include his immediate supervisor, technicians from the Soil Conservation Service, the State Department of Conservation; also various state and Federal agencies and representatives of local industries.

The county agent and his staff is in a strategic position to make a dynamic contribution to the conservation movement. To do so, he must be alert to the resource problems and opportunities in his area. And too, he must understand the inter-relationships of all the resources—how each compliments the other. This kind of leadership will help greatly to speed up the conservation work on the land. It will also strengthen his position as a public servant as well as with others with whom he is associated.

The total conservation job ahead is big. It is challenging and rich in opportunity. There is no other area in agricultural programs where a better opportunity exists for teamwork than in the field of conservation—provided, however, each element or factor is considered in its proper perspective. Farm families, entire rural communities, small upstream watersheds as well as America's industrial and urban might—all have a stake in resource development programs. Helping to meet these needs is Extension's big challenge.

Habits Are Not Easy To Change

Man's habit of destroying the natural resources from which he lives is as old as civilization. He has developed and acquired this habit through hundreds of generations, and it will not be easy to change his ways. Yet we must change those ways. Such ingrained habits are not changed through man-made laws and regulations. Laws might be passed which prohibit the clean cutting of forests, the plowing up or over-grazing of grasslands on steep slopes, or which regulate the farming practices on all kinds of land. But such man-made laws can be repealed much easier than they can be passed, and they would be repealed unless an overwhelming majority of the people were in favor of them. Moreover, the enforcement of such laws is not a practical way to achieve true conservation; everybody would profess to practice conservation, while few would actually do it.

—TOM DALE AND VERNON G. CARTER
From Topsoil and Civilization

How We Do Extension Work In Soil Conservation

A Panel Presentation

The selections in this article are from a panel discussion presented at the Tenth Annual Meeting of the SCSA held at Green Lake, Wisconsin, September 13, 1955. Members of the panel were: Wendell R. Tascher, extension soil conservationist in the Federal Extension Service; Arnold Wiebusch, extension soil conservationist agent, Goodhue County, Minnesota; Elmer Lund, extension area soil conservationist, Iowa; and E. O. Baker, erosion control agent, Wisconsin.

AS EXTENSION SOIL Conservationist in the Federal Extension Service, I am leader of the Extension project in soil and water conservation. Most states have extension projects in soil and water conservation with assigned leaders. At this time there are 62 such extension workers in the United States and Territories. I work particularly close with these men.

We conceive our educational objective as bringing to the people an understanding of the problems and opportunities in land and water care and that information needed by them to make progress with the needed action. We approach the work principally as specialists in conservation education and work closely with subject matter specialists whose specialties are related to conservation. We recognize that many other agencies, organizations, groups, and individuals are carrying on effective educational activities. We try to the best of our abilities and means to discharge the educational responsibilities of the Extension Service of the United States Department of Agriculture.

Extension activities in soil and water conservation seem to fall quite naturally into four areas: (1) those concerned with on-the-farm problems and solutions—the technical aspects; (2) those directed to the interests and undertanding of young people; (3) those which can be related to home demonstration work so that appropriate information can be brought to women, and (4) those which are done with leaders and organizations. The various methods and materials commonly used in Extension work are used in connection with these activities. The resources of conservation agencies have been especially useful in conducting educational work.

The development of effective educational materials, other than that by State and Federal conservation agencies, has been unusual in amount.

At this time we are giving special thought in our educational work to such matters as these: (1) a change in basic philosophy in conducting 4-H Club work so there will be a sounder educational impact through relating activities that concern animals, crops and land; (2) special educational needs in watershed programs; (3) educational methods and materials for use in home demstration activities in soil and water conservation; (4) further application of the land judging idea to pasture and range lands; (5) leader training for 4-H Club work in soil and water conservation, and (6) refinement of educational methods effective in strengthening the decision-making of farmers with respect to their planned conservation work.

The effort of soil conservation extension workers in the Federal and State positions is directed primarily to county extension programs in soil and water conservation. County extension workers with their local leaders plan and carry out educational programs under conditions of considerable autonomy. An important development of the past decade has been the further definition of resources which are available for furthering soil and water conservation. Within the conditions of freedom for program development, with better training than ever before as educators and with tremendous resources available to farmers to implement action, county extension agents are

Figure 1. Harold Biegart, a former 4-H Club boy at Junction City, Kansas. His experiences in club work have given him an excellent background to help meet the many problems in farming.

—Photo Courtesy U.S.D.A. Extension Service

Figure 2. Larry Torrance, 1946 Regional winner of the National 4-H Soil and Water Conservation Program. Larry is now a county agent in Georgia.

doing outstanding work in soil and water conservation. Selections from the reports of the three men of the panel illustrate this good work.

—WENDELL R. TASCHER

Farm Visits Are Important

I BECAME the first Goodhue County, Minnesota, extension soil conservation agent on September 1, 1951. My life's work is farming with occasional time out for community affairs. We bought the home place just a few years before the depression hit us. We raised a "depression" family and we farmed through years when farm mechanization and farm electrification came our way. Our farm was a Civilian Conservation Camp demonstration farm. Later I helped organize a soil conservation district and it was my privilege to serve seven years as a supervisor of the East Goodhue District. During the war I filled in for Dave Shea, our district conservation aide, while he was over in Korea. I taught veteran training for four years at the Red Wing High School. Since 1951, I have been associated with extension soil conservation work. I mention this simply because I wish to point out that I am familiar with the people, the soil, and the farming methods common to Goodhue County. I am also familiar with the programs of the various agricultural agencies.

The Goodhue County Extension Office is a "clearing house" of ideas; ideas that have been painstakingly assembled within the realm of research, destined for the farms and homes of rural America. These ideas come to us in Extension: we look them over and if they are applicable they come into the county as recommended practices.

I sincerely believe the most appreciated service that I have rendered in my work as soil conservation agent is the farm visit. I have been making an average of two such farm visits every day for the past four years. Up to this time, I haven't met one farmer that doesn't recognize that soil problems do exist. I am happy to say that each and every one of them is doing something about it. It is not always according to the standards set up by others but the trend is toward better land use and that is awfully important.

If one delves into the farm business to thoroughly understand what the farmer is doing and the problems confronting him, I assure you that before long a mutual understanding will develop into a farm plan with only a minimum of assistance. This getting down to a mutual understanding is especially important because that is when we really begin to "hit."

Most of the Goodhue County farms are affected by erosion so we recommend contoured intertilled strip cropping with two years out of four in hay crops with corn and grain the other two years. With the field arrangement complete we approach the point where the farmer's problems begin. This is the critical spot in the development of the plan and the surest way for the farmer to get through this transition period successfully is by a fuller appreciation of his own potential as well as that of the soil and his investments.

Cost has always been considered an obstacle to conservation. We have worked on this with our county bankers. We see a trend toward a new credit system of loans at low interest rates to farmers for soil installations, drain-

Figure 3. A group of school teachers in Muskegon County, Michigan, getting first hand information on sod waterways and other conservation practices.

Figure 4. *Left:* Land judging is as important as judging cattle. It is now a recognized extension activity throughout the nation. *Right:* Farm women in Michigan conduct organized tours to nearby farms where conservation practices can be studied.

age, lime and fertilizers. Last winter 300 rural folks of the Red Wing trade-area filled a school auditorium to capacity at a testimonial banquet in recognition of what one bank is doing for the farmers.

Our State Soil Testing Laboratory is making a tremendous contribution toward the conservation of our soils resources. The soil testing service is timely and much needed. Several thousand soil test reports have passed through the Goodhue County Extension Office during the past four years. Samples were taken from fields where the farmers were having difficulties in maintaining proper rotations, problems of low yields and many others. We are making the fertilizer, lime and organic matter building recommendations that go to farmers to help them correct soil problems.

Now we bring back productivity to a soil in one year which formerly required many years. We are replacing erosion conducive tillage with a system which reduces tillage and increases resistance to erosion. Corn production is an example of this change. Where corn at one time was pointed to as the worst offender in soil erosion, today we can point to the fertilized fields where the thick stands and reduced cultivation have cut erosion to a very low level. Legumes are assured in proper sequence in the rotation by proper soil treatment.

We have field demonstrations this year and we had them in past years. These include demonstrations by farmers on various crops where they are using fertilizers, lime, plow-down, tillage methods and new varieties of crops. We're growing them with check areas to show the comparative results. They have been convincing. Last year we had corn yields that were increased more than 300 per cent where special effort was made to balance plant nutrients. We are using the soil test as a guide to better farming and we're using it to produce more abundantly by using the soil according to capabilities. Through this we are working toward a reduction of cultivated areas. We are farming less land in the lower soil classes and more of our intensive farming to the better acres.

Pasture improvement is another area we are working on. Much of our land should not be tilled at all. We need to pull our tillage machines from some of this rougher land. Here controlled grazing and fertilizing of the grasses adapted to these areas, or reforestation, will eventually take over.

We are using an extensive program of general information with educational materials. Bulletins, films and colored slides are available for all age groups. I have a good selection of colored slides showing local scenes of erosion at its worst. We have found that our folks prefer to look at pictures of the more constructive kind and at a job well done. We have such pictures also.

We have regular radio programs, as well as weekly news releases to the county press and several out-of-county newspapers and radio stations. We have tours, contests, demonstrations and field days. There are speaking schedules with organized farm groups such as Farm Bureau units, Farmers' Union locals, 4-H Clubs, FFA chapters, vocational agriculture classes at the high schools, and civic groups.

Right now we have three watersheds organized and in various stages of development. One of these has been approved by the State Conservation Committee. We also have a growing program in 4-H soil conservation project work.

We have a tree program that is steadily growing. Four years ago we had a total of 50,000 trees planted by the county landowners and last year this total had increased to over 200,000. The County Bankers' Association contributed two mechanical tree planters to help expand this portion of the soil and water program.

—Arnold Wiebusch

Figure 5. This community in Winona County, Minnesota, reflects its interest in resource use programs. The farms represented here used the information supplied by the Minnesota Extension Service, the Soil Conservation Service and other agencies.

Coordination of Watershed Activities

I WORK primarily with the Floyd Valley Watershed in northwest Iowa. It is an area of 956 square miles or approximately 600,000 acres of land and is part of six counties. The soils are loesial in character and are highly productive when properly handled, but due to water and wind erosion, there are many exposed areas of subsoil.

The area is subject to heavy rains. Since 1876 there have been 60 floods, five of which were severe, 10 moderate, and the others were of minor nature.

After the disastrous flood of 1953, plans were proposed for a program to reduce the flood run-off by upstream detention reservoirs and provide an adequate channel to carry the water through Sioux City to the Missouri River. This operation when finished would have cost 16 to 20 million dollars.

My specific job is to coordinate the efforts of the Floyd Valley Watershed Association, using the information supplied by Iowa State College, the technical assistance of the Soil Conservation Service and the assistance of other agencies and individuals. By this we hope to apply sound conservation practices, including the use of level terraces, on the land in the effort to hold the water where it falls, reduce run-off, and make the soil more productive. This will be less expensive and will keep the land in production.

Our extension methods of accomplishing this program are carried out through meetings of group and neighborhoods, through method demonstrations, radio and television programs, weekly newspaper articles, exhibits at public gatherings, and personal contacts. Local leadership has been supplied by directors of the Floyd Valley Watershed Association. This leadership has been very effective in promoting a thorough understanding of the conservation program.

—ELMER LUND

Area Conservation Education Activities

I AM ONE of four erosion control agents employed on an area basis in Wisconsin. We work closely with county extension workers and others in the counties of our areas.

Good land management and its place in the American way of life is being promoted in many ways in Wisconsin. A vital step in this field has been the development of an inter-agency understanding of responsibilities. A memorandum of understanding that serves as a guide to all concerned has been developed. A strong educational program has been the result of this united front in conservation.

Some of the fields that have responded well to conservation education include pre-service and in-service training for teachers at all grade levels. A school program designed for both elementary and secondary school students has been especially well received. 4-H Club activities and Vocational Agriculture curriculum have incorporated conservation in their programs. The assistance of conservation agencies has been enthusiastically received by the State Department of Public Instruction, The State Board of Vocational and Adult Education, and the State 4-H Club Department. Other rural and urban youth and adult groups have been assisted with program development and the carrying out of their conservation activities.

Considerable time has been expended by extension soil conservationists in preparation of educational publications and materials. The community watershed approach is being used to promote good land management on a group basis. The Wisconsin Idea is "move ahead with a united front in conservation."

—O. E. BAKER

The Soil Conservation Program of the Sixth Naval District

P. CORRADI

Back around the end of the eighteenth century if you wanted to start a Navy all you needed were a half-dozen frigates, a few wharfs where they could tie up for supplies, and a strip of sandy shoreline where they could be beached when their hulls needed to be scraped and painted, and you were in business. At least that's all the United States Navy had to start with after Congress authorized its formation in 1794.

If someone had predicted at that time that the Navy some day would be concerned with soils and slopes and grass and geology he probably would have been run out of town. In fact the Secretary of the Navy might well have led his pursuers.

P. CORRADI

EVEN AS LATE as 1910 the Naval Districts were concentrated along the coasts and on the Great Lakes, with the rest of the country a vast expanse in which the Navy had but very little interest. It used to be said in those days that the boys who joined the Navy were mostly farm lads who wanted to get away from the job of milking cows and try living on the water.

But that was forty-five years ago. The years between then and now have witnessed two major wars and a couple of minor ones—and changes amounting to a revolution within the Navy.

Nowadays a Navy man is almost as likely to be serving at a depot in Nebraska or an airfield in Iowa as he is to be at sea. Because today, America's widespread Navy has become one of its big landlords. To cope with the complexities of modern warfare we have had to develop a Navy Shore Establishment consisting of shipyards, airfields, supply depots, training stations and a number of other large and expensive facilities, scattered throughout the United States.

Together they cover several million acres of land. And as you are all aware, several million acres of land can add up to several million problems. The finding of technical solutions to these problems is the responsibility of the Bureau of Yards and Docks.

The Bureau of Yards and Docks and the various naval districts have exercised great care in developing a program to solve the Navy's land problems. It is a program built on a foundation of close cooperation with federal, state and community agencies engaged in work on the lands.

This paper by Commander Peter Corradi was presented at the Annual Meeting of the Florida Chapter, SCSA, on October 7, 1955, at Pensacola, Florida. Commander Corradi is the District Public Works Officer of the Sixth Naval District with headquarters in Charleston, South Carolina.

Conservation Program

For the benefit of those who do not know how the Navy's soil conservation program operates, I should like, if I may, to review it briefly.

The Bureau of Yards and Docks, in Washington, D. C., has working agreements with the Soil Conservation Service and the Forest Service by which these agencies make their specialists available to the Navy on a loan basis. This enables us to call in top-notch specialists in soils, hydraulics, hydrology, vegetation, geology and other sciences relating to problems of the lands.

Each of the District Public Works Offices has similar working agreements with regional, state and local agencies. For examples, in the Sixth Naval District, at Charleston, South Carolina, we have agreements with the Regional Office of the Forest Service in Atlanta, Georgia; with the state offices of the Soil Conservation Service; and with several of the local soil conservation districts in which our naval activities are located. The state and regional offices of these agencies often are called on to make surveys and assist with the development of plans. The local soil conservation districts also assist with these surveying and planning functions. In addition, they serve as consultants and advisors to public works officers at individual activities, and help to apply the plan of work to the lands.

There are many advantages for the Navy in this type of program. Some of these advantages are:

1. We are enabled to call on specialists of widely varied training and experience, according to the nature of the job to be done.

2. Local experience in the soils, vegetation, geology, climate and the hydrology of each area is made available to the Navy.

3. The technical work force which serves the Navy

can be rapidly expanded or contracted according to the needs of the specific project. This is very important because the Navy's work loads vary altogether too widely to get the whole job done with permanent Navy employees.

4. The Navy is better able to coordinate its land programs with those of local agencies. Such coordination is conducive to good public relations at the activity level.

In the District Public Works Office at Charleston, we employ a soil conservation engineer who directs field surveys and the preparation of plans that are used to guide this work. The soil conservation engineer also arranges for the findings and recommendations of field technicians to be "cranked into" our construction and development plans. This coordination is necessary because of the complexity of the problems involved.

The Sixth Naval District

The Sixth Naval District includes the seven southeastern states of Tennessee, Mississippi, Alabama, Florida, Georgia, South Carolina, and all but the 16 easternmost counties of North Carolina. The activities of the Sixth Naval District include many types of establishments, each with its own set of soil conservation problems. These activities include naval bases and stations along the waterfronts, air stations and air practice fields of various kinds, supply and equipment storage centers, manufacturing plants, ammunition and fuel storage depots, active and reserve training schools and centers operating both as independent establishments and in conjunction with major activities, numerous industrial reserve plants, and testing and research stations.

The District Public Works Officer is headquartered at the Naval Base, Charleston, with a staff of officer and civilian technical and administrative personnel. The District Public Works Officer—District representative of the Chief, Bureau of Yards and Docks—handles technical guidance and contractual relations involved in the planning, design, construction, overhaul and maintenance of buildings, structures and fixed equipment at shore stations within the Sixth Naval District.

Except for routine "housekeeping" and minor construction, overhaul and repairs, all such work at shore stations is done by contract. Soil conservation and erosion control measures are sometimes done by station forces as part of their "housekeeping," and sometimes they are contracted, depending, in general, upon the size of the job.

I have given you this outline of Naval operations in the Sixth Naval District so that you may have a better understanding of just where soil conservation fits into the overall picture of the Navy's many complex activities and functions. Let us see what else is involved and how the soil conservation program is handled in the Sixth Naval District.

A Variety of Problems

The Sixth Naval District extends from the Atlantic Ocean to the Mississippi River, from the Gulf of Mexico to Virginia and Kentucky. In this area we have the blistering summer sun of the sub-tropics and below-freezing cold of the Tennessee-Carolina mountains; torrential rains, searing drouths and soil-moving winds. Hurricanes, cyclones and tornadoes also claim our attention from time to time. All of these climatic phenomena directly affect the soil conservation program of the Sixth Naval District.

Then there are the soils themselves: the sands of the coastal plains; the clays and silts of the uplands and major river valleys; the rocks of the mountains; and coral of the Florida peninsula. You people can appreciate as well as or better than I can the problems that may develop on Naval stations situated on these various soils in their respective climatic belts.

The grasses, trees and other plants used in the Navy's soil conservation program are of the same kinds used by farmers in their soil conservation programs. I assure you the Navy has no Ouija board or supersonic magic whereby we are any more successful at growing grasses away from their proper soil and climate adaptations, or with less fertilizers, than you or the farmers.

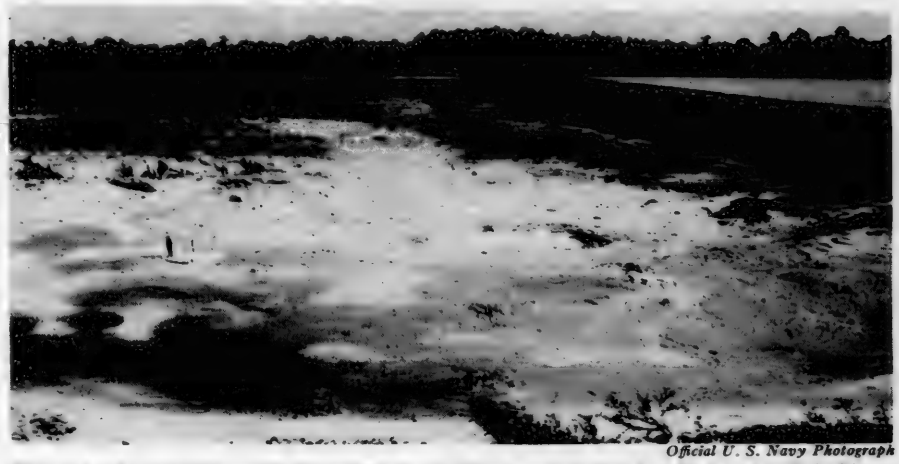
New Construction

Let's look at some soil conservation problems resulting from conditions created by *construction.* Naturally, the size of the station will affect the extent of the soil conservation problem. *In the Sixth Naval District, the stations range from a fraction of an acre at some recruit and reserve training centers to thousands of acres at airfields and storage areas. On some of the larger stations up to three square miles of natural vegetation are removed. Surface soil is stripped from hundreds of acres. Subsoil is exposed. Acres and acres of roof and pavement are installed. Storm runoff is greatly increased. Drainage ways which easily handled the occasional flow from previously wooded and grassed areas are greatly overtaxed. Unless provisions are installed for carrying the increased flow, serious erosion can happen.* At some places new outfall channels have to be cut for as much as two and three miles to reach a stream channel capable of handling the extra flow. This was done at Naval Auxiliary Air Station, Sanford, Florida and Marine Corps Supply Center, Albany, Georgia. Deep drainage ditches frequently cut into flow sands. They require special treatment. Lateral flow into large drainage ditches must be intercepted to prevent excess bank erosion. Where the shoulders of airfield runways are on fill, the runoff must be intercepted and let down the fill slopes in relief

drains. At ammunition and underground fuel storage areas, earth fills over igloos and tanks must be vegetated.

Maintenance of Naval Stations

There are other soil conservation problems more closely concerned in the *maintenance* activities at naval stations. Wild vegetation returns to choke drainage ditches. Streams meander and cause banks to cave in. Bed loads are deposited and have to be removed periodically. To maintain adequate grass cover on vast areas of very sterile soils, fertilizers and more fertilizers are needed. Then to prevent the grass from getting too tall and to prevent grass fire hazards, it has to be mowed. The mowing alone at the average air station is a full-time job during the growing season. *Airfields have their own peculiar type of erosion—jet and propeller blast. This problem has not yet been 100 per cent solved. Sod covered practice fields also present peculiar problems. Planes use a landing or "bounce" area until the vegetation is worn off, then move to another area. The new area is worn out before vegetation is reestablished on the first.*



Official U. S. Navy Photograph

Figure 1. At locations used for warm-up of planes, vegetation is killed and soil is blown away. Some areas are not subject to the blast effect. However, the soil in this illustration is a light, sandy type and is visibly affected. Height of the stumps to the left indicates depth of soil that has been blown away.

These are a few of the more common soil conservation problems at Naval stations in the Sixth Naval District. You can readily see that their solutions are not simple. It is not just an engineering job. It is not just an agronomic job. Or forestry. Or soils. Many of the sciences are needed at times. The Navy has had to call upon the Soil Conservation Service and Forest Service to lend us teams of engineers, foresters, soils scientists, ecologists, agronomists, hydrologists, geologists, and other technical specialists to help us handle our soil conservation problems.

The Navy's Plan

We feel the Navy's is a unique, yet most effective, approach to the problem. We are highly pleased with results we are getting. A large part of the success we have achieved must be attributed to the fine cooperative attitude displayed by all the conservation technicians now cooperating with us on the program, and also those who have worked with the Navy in the past. It would be impossible for the Navy to obtain the services represented by all of these talents except as they are made available by the cooperating agencies.

Plans for Whiting Field were developed by a team of technicians from the Soil Conservation Service. For some of the hydraulic designs on this project, they made scale models of the high-velocity convergence sections and energy dissipators at St. Anthony Falls, Minnesota, where there is a large, specially equipped hydraulic laboratory. The development of certain of these sections represented an important hydraulic achievement. One of their designs is now called the "Whiting Field" outlet structure.

For vegetative cover, the technicians decided to make extensive use of Pensacola Bahia Grass. However, seed in sufficient quantity was not available on the open market. Therefore, the Soil Conservation Service set up their first project for mass production of Pensacola Bahia Grass seed at one of their nurseries and produced about ten tons of seed for this particular job. This project represented a pioneer operation in the use of Pensacola Bahia Grass on such a large scale. Whiting Field is now producing Bahia seed for other naval stations.

Not only has the Navy made use of technicians obtained from agencies in the U. S. Department of Agriculture; we have appropriated to our use the Soil Conservation Service's concepts of land classification and soil conservation planning, based upon the soil survey. How this is done depends upon the stage of station development at the time the soil conservation survey is made. If all construction is complete and the station is in full operation, the soil survey is made; existing and potential problems are identified; appropriate treatments recommended and written into a long range maintenance plan similar in basic principle to the plans being written for farms. If, however, we get the jump on the planning and construction phases of a station's development we

Official U. S. Navy Photograph

Figure 2. Not only is the soil harmed, but expensive machinery is injured by dust sucked into the intakes.

may have the soils mapped before the station is designed. This makes the soils information available to design and construction engineers for making valuable determinations as to grades, drainage, stockpiling of desirable soils, removal of undesirable soils, steepness of construction slopes, etc. In some instances soil surveys are made before acquisition of a site as a supplement to our site feasibility surveys. Where surveys are made at existing stations and expansion is being considered, the surrounding land is included in the survey.

There are 105 separate landholdings in the Sixth Naval District covering 117,280 acres. This does not include "city" property used for recruit centers, etc. Twenty-five separate landholdings have had soil conservation surveys made on 83,277 acres. Thirty-six of the 105 locations with total area of 71,436 acres are occupied by personnel. The rest are outlying support areas or inactive. Of the occupied areas, 18 having 50,714 acres have been mapped. Seventeen cooperative agreements have been executed with Soil Conservation Districts or the Soil Conservation Service, covering a total of 44,214 acres. Two Forest Management Plans have been prepared by U. S. Forest Service on 1,565 acres of forest lands on Naval property. You can see we are making progress. There is still a big job ahead.

The Navy has adopted two systems of land classification. One, as I mentioned a moment ago, is the Soil Conservation Service system used in its farm surveys. Most of you are familiar with the system of grouping soils into eight classes, numbered I to VIII, with each class colored a distinctive color on the map for easy identification. As most of you know, Class I, shown by light green, is the best land, and requires the minimum maintenance attention to prevent deterioration. Classes II, III, IV, etc., are successively steeper, thinner, more hazardous to use, and require more and more attention to prevent deterioration.

The second classification originated in the Navy. It is a classification of the degree of alteration or improvement of the land for use by the Navy. This classification recognized that lawns, parade grounds, streets and most recreation areas are highly developed and frequently used, and require intense maintenance attention, and more than just a little "spit-n-polish." These lands are classed as Improved Lands, and show on maps as "I". Lands lying along runways, open lands used occasionally, drainage ditch right-of-way, etc., requiring occasional attention are classed as Semi-Improved, and marked "S" on the maps. Lands left in their natural condition are Un-Improved and marked "U" on the map. Since the layout of streets, buildings and other improvements follows more or less standard arrangements, it is not practical to confine the most used areas to the best lands. By showing both classifications on one map, the areas requiring most care in construction and maintenance are easily spotted.

Protection of the Navy land inventory is a highly important matter. *One very important development in the Navy's soil conservation program for protecting land inventories has been the development of conservation plans for outleased lands.* These are lands over which the Navy must retain control, but which are not currently being used. Some of them are inactive stations held for possible future mobilization. Some are unused portions of active stations. Many of these lands are leased to private parties for agricultural and other uses. At Memphis we have incorporated the soil conservation plan as a condition of the outlease. Now, the farmers are maintaining our "spare" lands there for us with hay and small grain crops.

Summary

It is our belief that the Navy now has one of the best land management and grounds maintenance programs in the Military Establishment. We are pleased with the splendid cooperation we are getting from conservation organizations, and we are, in particular, indebted to the Soil Conservation Service, Forest Service and the local conservation districts for the technical assistance they have given us.

Their assistance in developing effective plans for soil conservation and erosion control work on Navy lands is invaluable in helping us to maintain properly the Navy Shore Establishment for which we are responsible to the American people.

Correction

The photograph in Figure 3 on Page 280 of Lloyd L. Harrold's article *Behavior of Water on the Land* which appeared in the November 1955 issue of the JOURNAL was improperly placed. It is upside down and should, therefore, be reversed.—EDITOR.

Where Have We Been? Where Are We Going?

H. WAYNE PRITCHARD

Ten years have passed since the Soil Conservation Society of America issued the first JOURNAL OF SOIL AND WATER CONSERVATION. The copy you are now reading marks the beginning of the eleventh year of publication. While the Society was in the "dream stage" for a number of years, its actual existence as an organization is now ten years. The 1955 annual meeting at Green Lake, Wisconsin, was the tenth such event. Several of the early chapters are ten years of age. The questions might well be asked "What have we accomplished in ten years?" and "Where will we be ten years hence?"

In this article some of the Society's history, highlights of activities, and aspirations of various leaders regarding the organization are reviewed. It also includes forecasts for Society activities.

H. Wayne Pritchard

THE HISTORY OF THE SOCIETY is first recorded in the minutes of a meeting held in Washington, D. C., February 16, 1943. Those present were H. H. Bennett, R. H. Musser, A. E. McClymonds, J. H. Christ, J. C. Dykes, A. L. Patrick, Glenn Rule, M. L. Nichols, L. P. Merrill, C. E. Luker, T. S. Buie, and A. E. Jones. R. H. Musser served as chairman of the meeting.

Previously a meeting had been held in Chicago on November 11, 1941, when Bennett, Musser, McClymonds and Christ proposed founding an organization titled "The American Society of Soil and Water Conservation." Musser, at the 1943 meeting, reviewed the thoughts of the "original four" by stating: *"An organization of this kind should be worthy of the people interested in work in soil and water conservation, and it should be the medium of expression of the people of this profession."*

Bennett stated: *"It should be the medium of an exchange of ideas in soil conservation and should also have as its objectives the furtherance of the science of soil and water conservation."*

It was agreed, on February 16, 1943, that such a society was desirable and that forthwith the necessary steps would be taken to formalize the organization.

Later in 1943 other meetings were held at which time various committees were appointed to work on membership, constitution and by-laws, publications, meetings, etc. Fortunately a full record of the early activity is maintained in the Society archives now located at 405 Iowa Building, Des Moines, and under the immediate supervision of Miss Frances Dwyer, former secretary for R. H. Musser.

Plans continued during 1944 and 1945 with Musser—Ralph, to his many friends—serving as chairman of the organizing group.

In the first issue of NOTES AND ACTIVITIES for April 1945 several items of interest are noted. First, the name of the organization at that time was *"Soil Conservation Association of America."* A hint was made, though, of things to come for a paragraph entitled "What's In A Name?" stated that consideration was given to "Soil and Moisture." Some of the minutes taken were recorded for "The Soil and Moisture Society." Records show that H. H. Bennett, founder, was of the following opinion: "I have a feeling that the word 'moisture' to some people more or less implies small amounts of water. It seems to me we are concerned with water, large amounts of water, conserving enough of it to stop erosion, grow crops, reduce floods and so forth." Bennett suggested that if a change was made it be, "Soil and Water Conservation Association of America."

W. G. Scott of San Jose, California, was quoted in the same issue: "The boys feel that the use of the word 'association' makes it too commonly associated with such organizations as fruit and vegetable associations, etc. The question in our mind is, can or will anything be done to consider changing the title to 'Soil Conservation Society of America' or 'American Society for Soil Conservation'?"

By mail ballot late in 1945 the membership voted 598 to 32 to change the name to *"Soil Conservation Society of America."*

Journal of Soil and Water Conservation

The April, 1945, issue of NOTES AND ACTIVITIES also stated, "Just as soon as membership permits, we will get out Volume 1, No. 1 of the JOURNAL." At that time considerable discussion was held as to the type of material

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which should be in the publication. One member observed that if the JOURNAL held rigidly to highly technical papers the major contribution could only be made by research staffs. "If this were done," he said, "it would tend to dull the interest of men on operations staffs. It appears there would be a great deal of interest in the JOURNAL if it would reflect the developments of soil conservation as they have taken place in this country or countries."

By July, 1945 the National Council had appointed Glenn Rule of the Washington, D. C., Chapter No. 1 to study plans for the JOURNAL. D. W. Stauffacker of Baraboo, Wisconsin, suggested he and his associates would like the JOURNAL to be "technical and of a scientific nature but yet not to the degree that we find most technical journals." He continued, "We also would like this JOURNAL to show reports of meetings, reports of new methods, research and readable human interest material."

Late in the same year, 1945, the National Council authorized the Society's publication and editorial committee to move ahead with publication of a JOURNAL. Edward H. Graham was chairman of the committee and the date of the first quarterly issue was set for July 1946. It was determined that: *"advertising should be included and that it should be of a high standard."* A call was issued for manuscripts early in 1946.

Walter C. Gumbel of Fairmont, West Virginia, soil conservationist for the Monongahela Power Company, accepted the editorship. Gumbel had previously served as state conservationist for the Soil Conservation Service in Pennsylvania and as extension soil conservationist in West Virginia.

The JOURNAL became a reality in July, 1946. Page size was 7½ by 10½ inches, gray cover, printed by Monumental Printing Company in Baltimore, Maryland.

A course for the JOURNAL, which has been followed very closely, was outlined editorially in Volume 1, Number 1. It stated in part:

"First we believe the JOURNAL *should represent the Soil Conservation Society of America. Secondly, it should present, with each succeeding issue, the latest and most authoritative information about the science of soil and water conservation and the principles of sound land use. It should be practical. It should be easy to read. It should be stimulating. It should actively champion the cause of soil and water conservation. It should, above all, be useful."*

The editorial continued, *"The pages of the* JOURNAL *will not be a source of delight to the dilettante. On the other hand, we do not subscribe to the notion that professional soil conservationists prefer their reading couched in stilted, scientific jargon, or interspersed with the maximum number of tables and graphs. We shall try to keep the* JOURNAL *on a course that is neither superficial nor pedantic. Let it be constructive and as alive as the science we seek to advance."*

It is a tribute to the Editor and the Editorial Board that the JOURNAL has succeeded in following the course originally outlined. It is doubly significant that this has been accomplished by an editor who has carried on this work in his "spare time" and by publication of manuscripts for the most part unsolicited. On many occasions, had additional staff been available to carry on the necessary correspondence and details, the JOURNAL could have reached greater heights. Despite all the handicaps it has made a significant contribution to conservation literature. It is in libraries of countries throughout the world from the Fiji Islands to Moscow.

Reprints of JOURNAL manuscripts are numbered in the millions. In 1953 permission was granted to a commercial company to reproduce one million copies of an article and they actually reprinted 800,000 copies. Most popular reprints include the glossary of terms from the 1952 issues and the *"Soil Erosion Survey of Latin America"* carried in 1954.

Advertising has been of a high quality with many national farm equipment, fertilizer and other firms sending their material. Advertising income has paid for approximately three-fourths of the production costs of the JOURNAL.

A new format 8½ by 11 inches and black and orange in color was adopted January 1, 1948. Printing was transferred to Wallace-Homestead Company of Des Moines January 1, 1955, and a third format with additional sketching by Felix Summers of Milwaukee was added as a part of the cover.

Content of the JOURNAL has been determined by the Editorial Board of nine members, serving staggered terms of three years, working in cooperation with the Editor.

In January, 1954, the Society discontinued publication of NEWS NOTES AND ACTIVITIES as a separate publication and incorporated them with the JOURNAL. They are under the supervision of the executive secretary.

Annual Meetings Have Been Inspirational

A full report of the annual meetings held by the Society would comprise an article in itself. The first annual meeting was held at the Morrison Hotel in Chicago, December 12, 13, 1946, with 250 in attendance. Highlights of the meeting included a paper by President H. C. Byrd of the University of Maryland who discussed *"Soil Conservation in a Democracy."* Later panels on the subjects *"The Science of Soil Conservation"* and *"Technical Phases of Soil and Water Conservation"* were appropriate topics for the first meeting.

In the 10 annual meetings held to date individuals from all phases of the movement have appeared on the

program. The JOURNAL has printed many of the papers presented.

First president of the Soil Conservation Association of America, later the Soil Conservation Society of America, was R. H. Musser. Other officers during the formative years 1941-45 included: A. E. McClymonds, Lincoln, Nebraska, first vice president; J. H. Christ, Portland, Oregon, second vice president and secretary-treasurer.

The first formal election of officers by the Society membership took place on December 13, 1946 at the first annual meeting. R. H. Musser was elected president; Lloyd E. Partain, first vice president; Kirk Fox, second vice president; Melville H. Cohee, secretary; R. G. Hill, treasurer. Council members elected at the first meeting included: Austin L. Patrick, Ralph F. Wilcox, G. E. Young, Ross D. Davies, J. H. Christ, Jay H. Price, Hugh S. Steavenson, and A. E. McClymonds.

Men from many walks of life have served in leadership of the Society. A complete list would read much the same as "Who's Who In American Conservation." The men who have served as presidents are shown on pages 26 and 27.

Membership Has Been Growing

C. E. Luker, now of Washington, D .C., holds membership card No. 1. Secretary Christ reported on December 9, 1945, that charter membership closed on September 1, 1945, except for soil conservationists in the armed forces, extended the privilege of applying for charter membership until December 31, 1945.

On December 8, 1946, J. C. Dykes, chairman of the membership committee, reported 1,266 charter members and 662 non-charter members for a total membership of 1,928 members.

Membership has grown each year except in 1951 and 1955. In 1951 the dues of members were increased from $3 to $5. In 1955 the dues of former associate members were increased by a similar amount. Membership on December 31, 1955 will, for all practical purposes, equal that of a year earlier. Figure 1 shows the growth of the Society to its present 6,052 members on December 1, 1955.

Several states have led in membership with the lead changing from one to another. During 1955 North Carolina reached a total membership of 346 on December 1, 1955, to move far ahead of Iowa with 278. The rank of the various states and territories with miscellaneous other information is shown in Figure 2.

Nearly 400 members reside in 44 other countries. Canada, Southern Rhodesia, India, Holland, Australia, New Zealand, Brazil, S.Z. Germany, South Africa, all rank high in membership outside of the United States.

Special recognition for certain members as fellows has been bestowed by the Society on 32 individuals. Honorary membership has been granted 29 men. Those in each

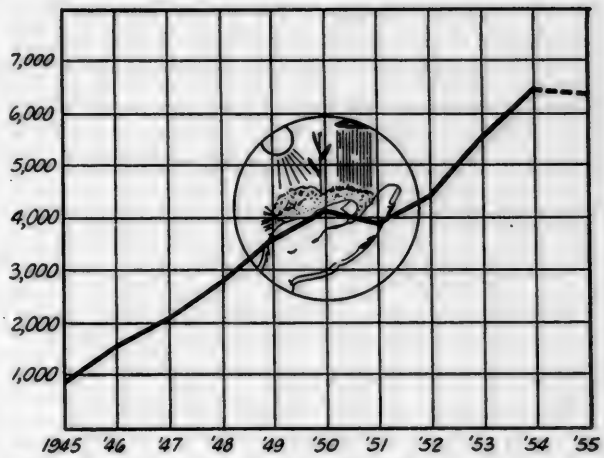


Figure 1. Growth of Society membership.

category have been nominated and elected in accordance with the constitution and by-laws.

Chapters of the Society have been formed in most of the states, Canada, and in South America. First chapter of the Society was formed in Washington, D. C., with others quickly following. Eighty-four chapters have been organized since.

Some Other Society Developments

On January 1, 1952, the Society opened its first national office with a full time staff of an executive secretary and clerical assistants. Considerable equipment has been purchased and numerous changes have been made to develop an efficient office.

Under the chairmanship of Arnold J. Baur of Ithaca, New York, the Society developed the first soil and water conservation glossary.

Two booklets have been printed and widely distributed by soil conservation districts, business firms, industries, members and friends of the Society. Over 400,000 copies of the popular booklet *Down the River* have been sold since it was first developed in 1951. In 1955 the booklet *The Story of Land* was printed and since June 1, 1955, nearly a half million copies have been distributed.

Reports of the various technical committees have been well received. At the present time the Society has technical committees on: Technical standards, watershed management, land classification, land utilization, drainage, quality of water, social factors, organic matter and soil structure. The committees are under the over-all supervision of Wallace Mitcheltree of Rutgers University.

The Society has represented the membership at the national level on the Scientific Manpower Commission, the Policy Committee of Scientific Agricultural Societies, the American Association for the Advancement of Science, the Natural Resources Council of America, the Joint Committee on Grassland Farming, the Watershed Congress and at many special meetings such as the American

Forestry Congress, the Mid-Century Conference on Natural Resources, the International Grassland Conference, the International Arid Lands Conference, and others. Such representation is valuable for the professional man.

I have listed some of the major decisions and development problems confronting the Society from its inception until now. The remainder of this article will give you some impressions of mine, plans of the council, and forecasts by some of our friends, regarding the future of the Soil Conservation Society of America.

The Next Ten Years

Membership at the end of the next ten years should approximate 15,000. This will mean a more rapid growth than during the past ten years but is based on the fact that more people will be assisting in Society growth. More people are acquainted with the Society and its program. We have a foundation for the next ten years whereas the future of the Society ten years ago was entirely problematical.

Other reasons for the optimistic outlook include improved chapter programs, an improved JOURNAL OF SOIL AND WATER CONSERVATION *possibly printed on a monthly basis, greater regional and national activities. Several have predicted a national membership of 25,000.*

A plan to maintain constant contact with and record activities of members, to coordinate membership drives in an organized manner, has been developed by the national membership committee under Harold M. Rhodes of the West Virginia Chapter. Under the plan each chapter membership chairman will serve on the national committee. Several chapters are cooperating with the national organization to collect chapter and national dues with a minimum of effort. It is anticipated that in the next few years the functional activities of the Society will take a more positive form.

In 1956 the Society will take the first step toward adding a full time editor to the staff. No final decision has been made as this issue of the JOURNAL went to press, but the correspondence, layout, composition, etc., has reached the place where it is difficult to handle on a part-time basis. By adding an editor to the staff it will be possible to devote more time to special sections of the JOURNAL, such as research reviews, field notes, etc. Additional time can be devoted to layout and to planning a schedule of manuscripts to interest the broad membership. Greater care in editing the manuscripts will be possible.

Many members have expressed a desire for a monthly JOURNAL rather than a bi-monthly. Future plans are being made with this in mind although it may not become a reality as soon as many hope.

In the next ten years it is anticipated that plans will be made to provide for and encourage additional attendance at annual meetings. Studies of meeting sites and facilities are being made with this in mind. It is expensive for individual members to attend the convention. It is hoped that some meetings can be held on college campuses or in other locations where accommodations are reasonable. Thought is being given to holding meetings prior to the start of school so families may combine vacations and attendance at the annual meeting.

Annual meetings are designed to provide inspiration to the individual, increase his technical knowledge and acquaint the the individual and his family with his fellow workers. Attendance at meetings broadens the vision of the member. With one annual meeting a year it is impossible for a high percentage of the membership to attend regularly. The council should give some consideration to holding regional-national meetings at least each two years, perhaps with an annual meeting as now scheduled on the alternate years. Through its meetings the Society should be reaching 2,500 to 3,500 members in regional and national meetings rather than the 400 to 800 we are now contacting.

Chapter Achievement Is Important

Additional thought and guidance needs to be given to chapter development, especially to programs carried out by chapters. All of the chapters must become active. Full benefit of membership will become a reality when every member can serve in a chapter activity. Some consideration should be given to geographical territory covered by chapters. In states where one chapter exists and travel distance presents a problem, the chapter will want to consider local tours, programs and projects as well as representation from the outlying areas. In states where more than one chapter has been organized a state-wide plan to correlate the work of the chapters should be established. In Kentucky this has taken the form of a Kentucky League of Chapters SCSA.

A national organization cannot be a potent force without strong local groups. The failure to recognize this axiom has been the downfall of more than one organization. In the Society we must build from the chapters. While the national organization can offer leadership, guidance, transfer of information, publications, meetings, and general house-keeping facilities, the parent group must not move far ahead of the "brood." Actually the national society speaks for no one except the combined voices of the chapters and members. If a chapter or a member is inactive, the national organization loses strength.

It is easy to lose the proper perspective of the national-local relationship. Most people have observed the democratic process in other organizations where originally the local groups expressed themselves but eventually a combination of national leaders with the supposed "know-how" and a certain degree of apathy on the part of the

"locals" led to the national passing down the directives of operation. *In some organizations there has been a tendency for committees, chapters, members and governing bodies to shift the work, programming, planning and general operating procedure on the shoulders of the central office staff. And some staffs like to accept such responsibility. This must not happen in the Soil Conservation Society of America! The Society must never employ a staff to determine the position or the function of the Society. The course must be charted by the membership and the staff handle their "housekeeping duties." Activity on the part of the chapters is the answer.* T. W. Edminster of Beltsville, Maryland, has served as chairman of the Chapter Achievement Committee. It has been their assignment to formulate a plan whereby the chapters of the Society might be judged and their activities evaluated. Their report is practically complete and should operate within the next few years.

Probably the most important service performed by the Society is to keep the member up-to-date with technical information in his field. I visualize an increased number of technical committees to report via the JOURNAL *and at annual meetings, through the press, radio and television. It will not be the assignment of these committees to carry on original research but rather to compile, survey and alert the members and the public to the particular project to which they are assigned. Some of their studies may well lead to research at educational institutions, experiment tions, research stations or by industry.*

On land use matters of significant importance to merit, the Society should, in the future, provide fellowships or grants to carry out the necessary studies.

Education and Public Relations

Most professional societies have a close alliance with educational institutions. Several of the societies have established criteria or standards for undergraduate courses in their profession. In some manner the Society, representing members at the present time who have a heterogeneous background of training at educational centers, must yield influence of the proper nature on the matter of training future land use specialists.

Additional student chapters of the Society should and will be established at the colleges and universities offering training. In actual practice there is competition for students among the professions and many professional societies are giving inspirational leadership on the campus, they are "selling," in a sense, the cause for which they are organized and the profession they represent. Training the future professional leaders of the science and art of good land use should be of paramount importance to this Society.

The broad membership of the Society makes it unique among the dozens of conservation groups. The Natural

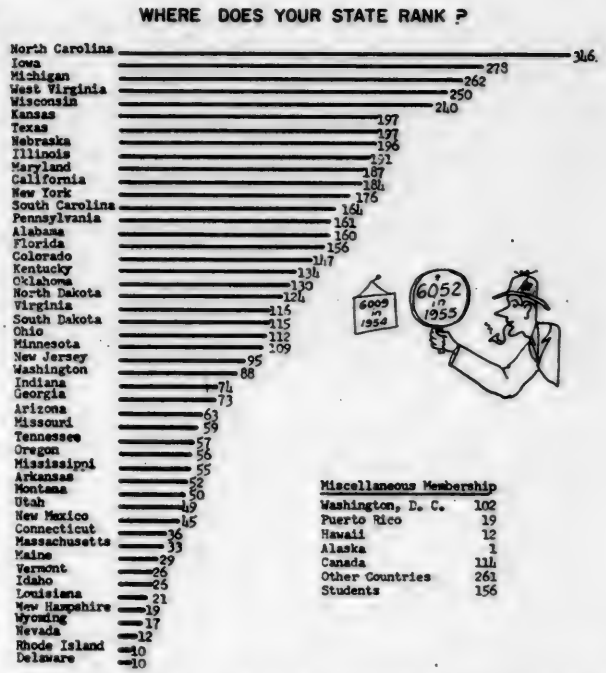


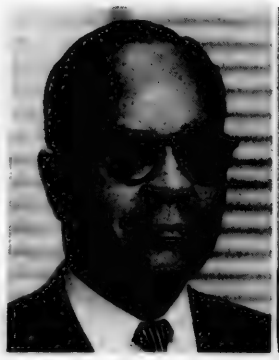
Figure 2. Rank of states as of December 1, 1955. The 6,009 figure for 1954 was for October 1 of that year.

Resources Council of America was established to provide coordination among the nearly 40 organizations holding membership in the council. It has led to an understanding among the national leaders of the various organizations but there is opportunity for the organizations to work together locally. Howard F. Barrows, chairman of the Society's Business and Organization Relations Committee, is in the process of contacting the national offices and leaders of about 25 other groups, "opening the door," for local chapters and local groups to cooperate. This will in no way be a directive but will depend upon the initiative of local chapters.

The place for coordination of conservation activities such as sponsored by conservation organizations should be as close to the land as possible. The value of working together is most beneficial to local groups—in our case at the chapter level. A soil conservationist should be in constant contact with wildlife, forestry, industry, business, farmers, and many other groups who have a stake in proper land use. The Society, through its chapters, has the opportunity to offer much to other groups, to strengthen their programs while at the same time developing the program and stature of the Society and the cause for which it exists.

Many business and industrial firms realize their responsibility in this field and are seeking means to advance the work. The Society offers an outlet for them. Many

These men, all presidents, have helped the Society become well established. They represent broad fields of interest and each has contributed much in advancing the science and art of good land use.



R. H. Musser—1947

T. S. Buie—1948

L. E. Partain—1949

Firman E. Bear—1950

are already taking part in Society projects or some other conservation program. Other firms have not found a suitable medium. The Society should always stand ready to cooperate, discuss, and assist in planning their participation.

It is time the Society develops additional recognition programs for many individuals and groups, for the unrecognized talent in our membership, for projects of great significance to conservation. The Awards Committee, chairmanned by H. A. Hopper of California, is planning a system which will accomplish this objective.

The Society can and should have an increasing impact on public opinion about the way citizens might treat the land. Additional booklets, press releases, radio and television programs by chapters and by the national organization are needed. The newly adopted objectives as published in the JOURNAL OF SOIL AND WATER CONSERVATION for November, 1955, contain many points that need to be implemented.

The day will come, perhaps not in the next ten years, when the Society will select the site and make plans for a national headquarters owned by the membership and dedicated as a shrine to *the art and science of good land use.*

Future developments of the Society will be financed by an increase in number of members, advertising, sale of Society publications, individuals and firms joining as sustaining members, by special grants from industries, foundations, by individuals who remember the Society in their wills. If we have reason for existence, we can be financed. Proper financing is important. A full report of Society finances will be carried in the March issue.

In this article I have reviewed some of the short history of the Society and have attempted to outline some of the possibilities ahead. Several prominent leaders in the Society were polled for their opinions about the future. Their replies are interesting and represent varied viewpoints.

Viewpoints of Others Are Challenging

Dr. T. S. Buie, second vice president and now state conservationist in South Carolina, mentioned several points and possibilities but one that was unique to his thinking: "I envision that the Society will more and more become a repository of much factual information regarding the science of soil and water conservation, and, especially, its development as a separate branch of science. Students of the movement begun by Hugh Bennett will naturally look to the archives of the Society as a source of much original material."

Dr. H. H. Bennett, founder of the Society, states: "The Soil Conservation Society of America has a splendid opportunity to move ahead in the field of helping the rapidly expanding program of soil conservation. A variety of problems are sorely in need of better public understanding. Two of these are particularly in need of the Society's attention. The organization, I am confident, is in a strategic position to help find the answers to at least two of these deficiencies, now growing much too rapidly: (1) The gap of misunderstanding between farmers and those who are not farmers is widening entirely too rapidly. (2) Are we doing our best to promote the never-ending job maintaining the soil and water conservation measures that we urge farmers to adopt?"

Morris E. Fonda, past president and now General Sales Manager, Harvestore Division, A. O. Smith Corporation, Kankakee, Illinois, states: "I see in the Society in the next ten years a relationship of progress which is directly related to the member individuals; not one, not a few, but all. How far we go and what we accomplish is dependent upon you, myself, and every single member of the Society. It means that all of us must take a dynamic position in relationship to Society activities, programs, meetings, finances and all other aspects of the SCSA. Our opportunities are unlimited."

First President **R. H. Musser** wrote: "Many predictions made ten years ago came true. The Society has grown, prospered and has accomplished many things far beyond reasonable prediction of ten years ago. There are at least 25,000 people who should be receiving the many benefits of the Society. They can, and, I believe,

M. E. Fonda—1951-52 H. H. Bennett—1953 R. Y. Bailey—1954 A. L. Patrick—1955 E. H. Graham—1956

will make a real contribution to the advancement of the science of soil and water conservation and the art of good land use."

Council Member **Fred A. Wirt** states: "Too many members of the Society and others deeply interested in 'advancing the science and art of good land use' are unable to attend annual meetings as they are held first in one section of the country and then in another. So looking into the future, I see chapter meetings becoming annual regional meetings where one or more chapters will sponsor one or two-day, possibly eventually three-day meetings, so that individuals interested in the conservation of soil and water can get together. Attendance at regional meetings will give those present the inspiration which arises from contact from others engaged in similar work. That is highly important, for very few of us are 'natural' self-starters who can carry on without periodic stimulation and encouragement."

What was probably the most "forward look" was taken by **Russell G. Hill,** long-time council member and second vice president for 1956. Hill in his daily work is Executive Secretary of Michigan State Soil Conservation Committee and Extension Soil Conservationist for that state.

Hill stated: "The Soil Conservation Society of America provides the crossroads whereby individuals, groups, and agencies interested in the various phases of land and water use have an opportunity to discuss its mutual problems and to work together for their solution. In the years ahead the competition by various segments of our Society for the use of these resources will definitely increase. The competition by agriculture, industry, municipalities, business and recreation for an abundance of high-quality water in satisfactory locations is but one example of this competition. The need for conservation statesmanship will be great. The Society, as the one organization interested in the many facets of resource management, is in a strategic position to give leadership to the orderly development of this complex use.

"In the next 10 years Society membership should conservatively double. Chapters should be active in every state as well as many foreign countries. It is likely that the JOURNAL will become one of the most powerful educational tools available in America in the field of land and water resource management. It is conceivable that the Society might well sponsor symposia on resource use, perhaps on a regional basis throughout the country. Society membership should form one of the basic sources of information on conservation policy. Its committee organization should reflect this opportunity.

"Public opinion in the main is conservation conscious. More groups are looking at our resources from an interrelated viewpoint; consequently, it may be advisable that the Society take advantage of changing philosophy by changing its name from one that has a rather limited connotation to another which reflects its broad interests. Perhaps our name should be changed to *The Society of Land and Water Conservation.*

"Resource management has become a world undertaking. It is no longer possible for us to evaluate and manage resources strictly on a basis of our individual farm, state or even nation. Coordination of resource use on a world-wide basis is the order of the day if we are to maintain peaceful relationships with other peoples of the world. Such a Society through its local chapters around the world would have a golden opportunity to promote more scientific resource use among its people. The opportunity for Society leadership exists. Will we be able to meet the challenge?"

Dr. Firman E. Bear, Council Member, states: "The Soil Conservation Society of America is unique in that it is designed to be of service to all the people of this nation, whether they belong to it and help pay for the services it renders or not. As long as land in climatic regions that favor plant growth is allowed to be bare, to be eroded by wind and water, and to be put to uses that are not commensurate with the qualities it possesses, there is work for this Society to do.

(*Continued on page* 39)

Earth Slips in the Allegheny Plateau Region

J. BOYD PATTON

Slips, as described here, are earth flows common in West Virginia, southwest Pennsylvania, southeast Ohio, and northeast Kentucky.

Earth slides are a fairly common erosion feature on steep, pastured hillsides in a large area of the Allegheny Plateau. These earth movements, commonly called "slips," occur in western West Virginia, southwest Pennsylvania, southeast Ohio, and northwest Kentucky. Sharpe (1) has described them in detail. Galpin (2) estimates that slips have occurred or may take place in an area of approximately 12,000,000 acres in this region. Individual slips range in size from about 100 square feet to several acres.

A typical fresh slip has a raw break at the upper edge, roughly on the contour. The slipped mass is commonly two or three feet lower than the undisturbed surface just above, and a vertical crack usually extends downward to bedrock. The slipped area has a hummocky or wrinkled surface, but the vegetation is usually not completely disturbed except at the edges of the area. A bulge usually occurs along the lower edge of the disturbed area, and severe slips may have a series of more or less parallel bulges or wrinkles. (Figure 1)

These slides are typically crescent shaped but they may be roughly rectangular, oval, or pear-shaped. Slips occur normally where sandstones, siltstones, and clay shales are interbedded. Limestone may be present in some soils. The underlying rock is horizontally bedded, or nearly so. These slipped areas are most numerous on Meigs (Gilpin-Upshur or Muskingum-Upshur complex), Westmoreland, and Wharton soils, and are fairly common on the Gilpin and Muskingum series, particularly where these latter soils occur on strata including fine grained siltstone and clay shales.

Some soil creep is a normal part of the geologic erosion pattern in this area. The word "Monongahela" means, in Indian language, *"River of Caving Banks."* This shows that the Red Man recognized the unstable character of this land. "Bench and break" topography, caused by differential weathering of the rock strata of varying hardness, as well as by some soil creep, is common in this area, but here we are dealing with man-induced slips, brought about by changes in the natural environment.

On agricultural land, slips usually occur on slopes of 20 per cent or more. Soil survey data for several West Virginia counties show that they are more numerous on slopes between 30 per cent and 40 per cent than on any other slope class, but are almost as prevalent on slopes above 40 per cent.[1] According to these data, they are less common on slopes less than 20 per cent than on the steeper slopes. Where excavation has removed the downslope support, as, for example, in road building, slips may occur on slopes considerably less than 20 per cent. These data also show that this form of soil movement is much more common on native grass pasture than on land in any other type of use. The survey of Harrison County, West Virginia, for example, shows that 6.8 per cent of all pasture land was affected by slips, but only 1.7 per cent of the woodland was so damaged. Included in the woodland acreage is a substantial amount of land which was formerly pasture, but has been allowed to revert to woodland. This probably accounts for most of the woodland slips.

Figure 1. Typical slip, six months old, in pasture on Meigs (Muskingum-Upshur) complex, 30 per cent slope, Class VII land.

This type of soil movement apparently occurs without regard to direction of exposure. Slips are more common in coves or concave-shaped slopes than on other slope patterns. This is probably because ground water as well as surface water tends to concentrate in coves.

Factors causing slips are:

1. Unstable slope.
2. A highly silty or clayey, but somewhat permeable layer, underlain by smooth clay shale and overlain by a very slowly permeable horizon high in clay.
3. Excess of water. During periods of prolonged and heavy rainfall, the soil becomes saturated and the water in the permeable layer apparently develops some head. (Figure 2)

The soil mass usually moves only a few feet. The

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1. Unpublished soil survey data for Cabell, Jackson, Harrison, and Roane counties, West Virginia.

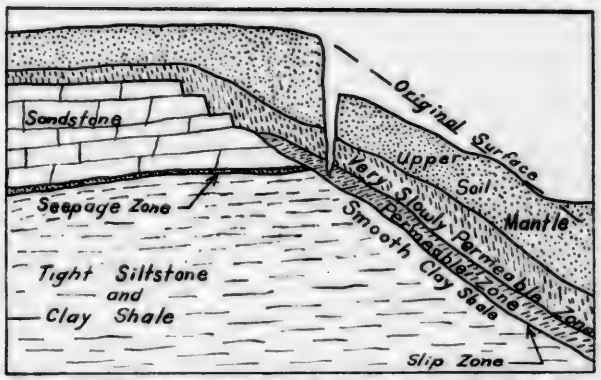

Figure 2. This exaggerated profile of a typical slip shows how soil becomes saturated and the water in the permeable layer develops some head.

Figure 3. View at head of slip showing typical vertical break. This area was in woods until about 15 years ago when it was cleared for pasture. Note stumps just beyond raw area.

movement usually takes place over a period of several days to three or four weeks, during a prolonged wet season; but it has been observed to take place in a few hours during an extremely intense storm. In June, 1950, such a storm occurred in Harrison and Doddridge counties, West Virginia, with rainfall intensites up to 14 inches in a 24-hour period, according to local records collected by the United States Weather Bureau. Immediately after this storm, the author observed 17 new small slips in one 10-acre pasture.

Underground water moving along the top of dense clay shale frequently contributes to the formation of slips. Survey data for Harrison County show that proportionately more slips occur on Wharton soils than on any other soil series. Wharton is a moderately well-drained soil with a heavy, slowly permeable, clayey subsoil, formed on clay shales, including fire clay. In Harrison County, 25 per cent of the Wharton soil in pasture was affected by slips. Westmoreland and Meigs (Gilpin-Upshur) are the other important upland soils in the county which are subject to slips, but only four per cent of the Meigs soil and 10.5 per cent of the Westmoreland soil in pasture was affected by this type of erosion.

Slips are most common in pasture. Livestock travel lanes sometimes help start slips. Slips frequently occur also where a steep wooded area has been clear-cut and converted to pasture. Here decaying tree roots offer a ready channel for water to enter the critical soil zone, but the roots no longer are able to anchor the soil. (Figure 3)

Slips occur occasionally in crop and hay fields. Where the disturbed area is small, cultivation removes the evidence in a few years; severely disturbed areas are usually turned back to pasture. As pointed out above, slips are rare in old woodland, but the scars and the characteristic topography are fairly common in areas which were pasture and have reverted to woodland. Gullies are often associated with these slipped areas. They frequently start at the lower edge or along the side where the grass cover is broken. (Figure 4)

Even in pasture, the raw parts of the slips usually heal in a few years unless gullies develop, but the irregular slope pattern lasts indefinitely. This is a serious obstacle to the use of machinery in mowing and treating pastures. Slips are a severe hazard in the construction of roads, railroads, farm ponds, reservoirs, buildings, pipe lines, and, in fact, many types of engineering structures.

Strip mining of coal, which is done in part of the area affected by slips, frequently changes the earth load distribution or center of gravity on steep hillsides. This kind of mining also causes concentration of water in crit-

Figure 4. Gully and soil delta formed below pasture slip. Class VII land, used beyond its capabilities. Meigs (Muskingum-Upshur) soil complex.

ical areas at the lower edge of the spoil bank, and these factors cause slips which would not occur otherwise.

It is difficult to predict exactly where slips will occur, but the hazard should be recognized in planning land use changes and in construction. Operations which increase the water concentration in slip-prone horizons, or which tend to disturb the natural load distribution of the soil, or to remove down-slope support, should be avoided. Some specific precautions which can be observed are:

1. Do not use the land beyond its capabilities. Slip-prone soils on slopes too steep for use as pasture should be kept in woods or reforested if now in pasture. (Figure 5)
2. Be particularly careful with slip-inducing practices on soils which are especially susceptible to this type of movement. Wharton, Westmoreland, and Meigs (Gilpin-Upshur, Meigs-Upshur) are problem soils, so far as this type of erosion is concerned. This warning applies to highway and industrial developments, as well as to farm practices.
3. Avoid practices which tend to concentrate livestock traffic in coves or other unstable slopes. Watering troughs should be located on a dry stable place, and the water should be piped to it. Hay should be fed in the barn or level feed lot, not on the steep hillside just "over the fence from the haystack."
4. Drainage is probably the most important prevention, and, although not infallible, the best cure. The underground water source must be located and intercepted near the place where it comes out of the bedrock, if drainage is to be effective. Planting or encouraging reproduction of tap-rooted trees helps to prevent slips; but these movements have tremendous force, and scattered, individual trees are sometimes "upset" by this type of earth movement. (Figure 6)
5. If a slip has already occurred in a field which is to be kept in pasture or cropland, it is probably best to "work down" the area and reseed it. This tends to restore surface drainage and smooth out the slope irregularities. The area should be shaped, graded, or drained, so that there are no pockets to hold surface water.
6. Where the expense is justified, piling anchored firmly into the underlying rock strata helps reduce this kind of soil movement.

Summary

Slips, as described here, are the result of a type of mass movement of soil, fairly common over an extensive area of the Allegheny Plateau. They are usually crescent-shaped or roughly rectangular, with a short, vertical drop at the upper edge and a bulge, or irregular series of wrinkles and bulges, at the lower side. The earth mass usually moves only a few feet, but raw breaks in the cover usually occur at the top, along the sides, and, in severe slides, at the bottom. Some breaks or raw exposures usually occur within the slip area.

Gullies often start at the lower edge of slips, or along the broken sides.

Conditions leading to slips are:

1. Soil with a clayey, slowly permeable lower subsoil, formed on smooth clay shale and/or shale and siltstone.
2. A fairly steep, unstable slope.
3. Excessive surface and subsurface water. The soil just above the bedrock approaches or reaches the plastic flow stage, serving as a lubricant, and the mass movement occurs.

Slips are most common on native grass pastures. They rarely occur in good woodlands. They are fairly common on land which is so steep that it should never have been cleared. Severe slips sometimes force farmers to abandon pastures which were otherwise productive fields. They cause extensive damage to highways, railroads, pipe lines, and buildings.

(Continued on page 33)

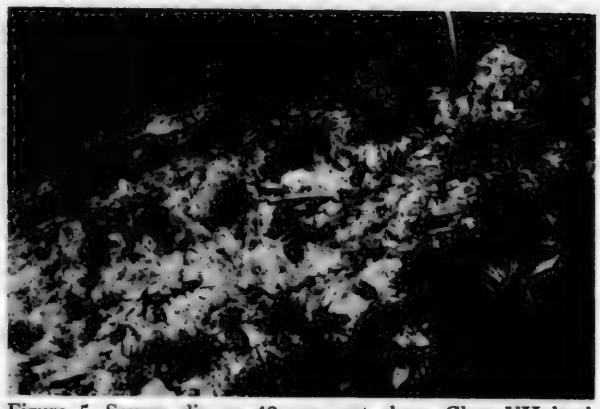

Figure 5. Severe slip on 40 per cent slope, Class VII land, being used as pasture. Slopes as steep should be kept in woods as shown in background.

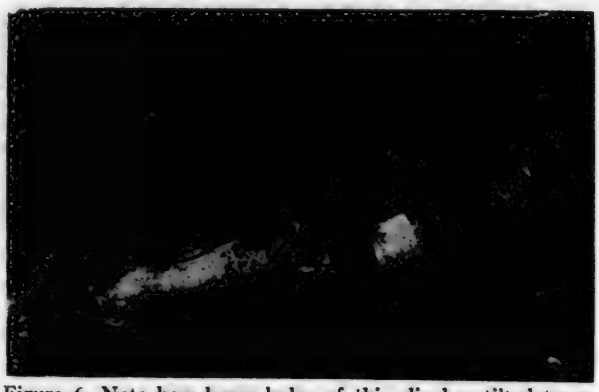

Figure 6. Note how lower bulge of this slip has tilted trees.

Quality of Irrigation Water

C. H. WADLEIGH, L. V. WILCOX AND M. H. GALLATIN

"Quality of water" may carry different implications to different persons. To one, the term may bring to mind industrial pollution of streams. Another thinks of medicinal properties of a spa. Quality, to still another, refers to the content of boron in irrigation water. This report is confined to evaluation of water quality as affected by naturally occurring solutes.

THE QUALITY of irrigation water is determined by (a) the kinds of dissolved salts, (b) the relative proportions of certain ions, and (c) the total concentration.

All naturally occurring ground waters contain chloride, sulfate, and bicarbonate salts of calcium, sodium, and magnesium. The concentration of these various ions may vary from a fraction of a part to several thousand parts per million. Potassium, nitrate, fluoride, carbonate, iron, and boron may also be present in small amounts in waters used for irrigation. Almost any ion present in irrigation water at relatively high concentration can be toxic to crop plants. Thus, beans, avocados, and peach trees are among those comparatively sensitive to chloride; almond and avocado trees are rather intolerant of sodium.

Water quality is frequently impaired by boron in certain areas of the West. F. M. Eaton has extensively studied the response of plants to boron. Although this element is essential for growth, it is exceedingly toxic at concentrations only slightly above optimum. Most fruit trees are sensitive to low concentrations of boron. Citrus trees are injured when only 1 p.p.m. of boron is present in the irrigation water. An evaluation of the relative tolerance of crop plants to boron may be found on page 67, *United States Department of Agriculture Handbook 60.*

The bicarbonate ion can also be troublesome. C. P. Harley and R. C. Lindner studied a number of apple and pear orchards in North Central Washington in which the trees showed marked lack of vitality irrespective of good cultural practices. Use of irrigation water containing 200 p.p.m. or more of calcium and magnesium bicarbonate was directly associated with the poor health of the trees. Examination of the roots of affected trees frequently showed the formation of a lime incrustation of appreciable thickness around the roots. Harley and Lindner justifiably concluded that these carbonate concretations on the roots were formed by calcium carbonate precipitation from the irrigation water. The condition undoubtedly affected the mineral nutrition of the trees and induced their poor health.

Several instances of poor quality of water due to dissolved ferrous bicarbonate have been found in well waters along the Atlantic Coast. This substance is not toxic per se but, on being exposed to the air, the iron compound precipitates as ferric carbonate and gives the water an exceedingly muddy appearance. When such water is applied to vegetables by overhead irrigation, an unsightly rusty coating appears in the heads of lettuce, cabbage, cauliflower and celery.

An excess of sodium bicarbonate in the irrigation water can be especially hazardous under an arid climate. F. M. Eaton studied soil conditions in the irrigated areas of the Nile and Euphrates valleys—the oldest irrigation projects in recorded history. "Black alkali" was found to be prevalent in the Nile Valley whereas none was at any time observed along the Euphrates. On studying the composition of the waters of these two rivers, he found that residual sodium carbonate was always a constituent of the Nile water but never of that of the Euphrates. Residual sodium carbonate (RSC) may be defined as follows:

$$RSC=(CO_3^{--} + HCO_3^{-})-(CA^{++} + Mg^{++})$$

This equation indicates in milliequivalents per liter the excess carbonate plus bicarbonate over the milliequivalents of calcium plus magnesium in the water. Eaton found the relationship between the RSC of water and soil condition to hold in a large number of irrigated areas within the United States; i.e, "black alkali" or high sodium soils are likely to develop where residual sodium carbonate is present in the irrigation water. Since these soils resist improvement through management practices, irrigation waters that bring excessive sodium into them are of serious concern.

The West does not have a complete monoply of waters that contain too much sodium. There are numerous irrigation wells along the Atlantic seacoast having water with appreciable amounts of residual sodium carbonate.

Effects of Ionic Proportions

In the irrigated valleys of the West, one frequently hears that "hard water makes soft land and soft water makes hard land." Soft water is characterized by a low

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This paper was presented by Dr. C. H. Wadleigh at the Tenth Annual Meeting of the Soil Conservation Society of America held at Green Lake, Wisconsin, September 14, 1955. It is a product of the Society's Technical Committee on Quality of Water.

Dr. Wadleigh, Chairman of the Committee is chief, Soil and Water Conservation Research Branch of the Agricultural Research Service. His headquarters are at Beltsville, Maryland. Dr. L. V. Wilcox is senior agronomist, U. S. Salinity Laboratory, Riverside, California. Dr. M. H. Gallatin represents the Eastern Section in Soil and Water Management of the Soil and Water Conservation Research Branch with headquarters at the Truck Experiment Station, Norfolk, Virginia.

level of calcium and magnesium in the dissolved cations whereas water is made "hard" by increasing concentrations of these ions. When the cation exchange complex of the soil contains an increasing proportion of exchangeable sodium in place of calcium, there is an associated deterioration of the physical properties characterizing good tilth. Sodium soils tend to be impermeable to water and to be dispersed by water. On drying they become hard and intractable. The U. S. Salinity Laboratory has derived a formula for characterizing water with respect to its tendency to bring about a deterioration of soil physical characteristics. It is known as the sodium-adsorption-ratio and is defined as the milliequivalents of dissolved sodium per liter divided by the square root of half the sum of the milliequivalents of dissolved calcium and magnesium per liter; thus—

$$SAR = \frac{(Na^{+})}{\sqrt{\frac{Ca^{++} + Mg^{++}}{2}}}$$

Agriculture Handbook 60 presents a nomograph (page 73) showing the relation between sodium-adsorption-ratio in the water and the exchangeable sodium percentage (ESP) of the equilibrated soil. An SAR value of ten is associated with an ESP value of 12. Physical properties of soils tend to deteriorate if the exchangeable sodium percentage exceeds 15 (or, in some instances, if it exceeds even as low a value as 12). Thus, irrigation water with an SAR value exceeding ten may be hazardous under climatic conditions conducive to formation of sodium soils.

There is evidence that water containing chloride salts is twice as toxic to plants as water containing an equal concentration in terms of parts per million of sulfate salts. However, chloride solutions are about twice as active as sulfate solutions in carrying an electric current. This means that if the salinity of the water is measured by means of electrical conductivity, the differences between sulfates and chlorides cancel, and the measured values may be used without correction.

Total Soluble Salts

A predominant hazard in use of water for irrigation derives from an excess of soluble salts. When soil is irrigated with water containing dissolved salts, drying of the soil by surface evaporation or root absorption brings about an appreciable increase in the salt content of the soil solution. Water is lost but the salt remains. Continued light applications of water without the leaching effects of rain or a heavy irrigation will continuously tend to build up the salinity of the soil solution. Just as sugar can take water out of strawberries or brine can remove water from cucumbers, a salty soil solution can cause the root to lose water to the soil. An accumulation of dissolved salts in the soil solution from the continued use of water with even a relatively low level of dissolved salts will decrease the availability of soil water to plants. This can become sufficiently serious to stop the germination of seeds or seriously impair the growth of plants

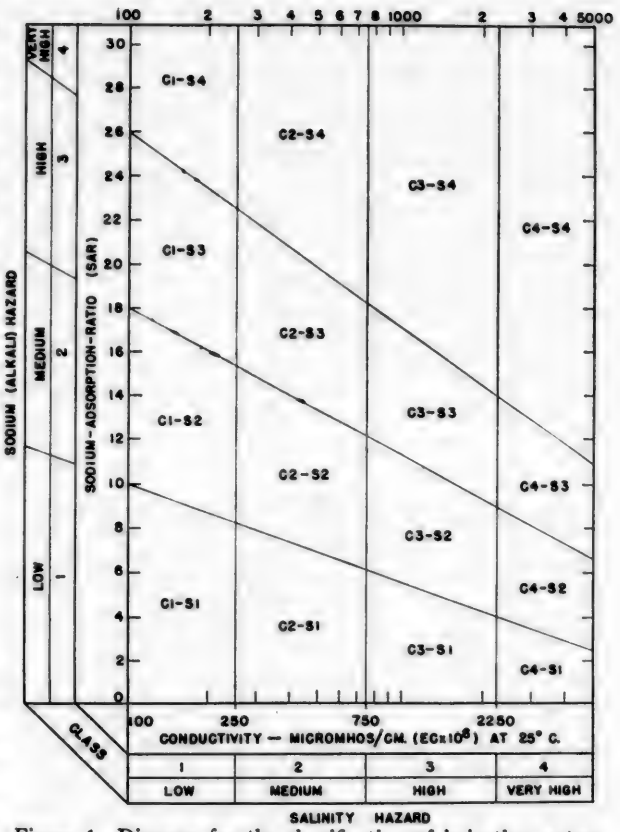

Figure 1. Diagram for the classification of irrigation waters.

Measurement of Salinity

The most convenient basis for evaluating the salinity of irrigation waters is electrical conductivity (EC). For example, a water having an EC of 750 micromhos/cm. is considered to be on the borderline between a medium and high salinity hazard (see *USDA Circular 969*). A water that has an EC above 2250 micromhos/cm. should be avoided.

Those who find it most convenient to think of salt content of irrigation water in terms of parts per million may roughly convert the micromhos/cm. to parts per million by multiplying by 0.64. Thus, an EC of 750 micromhos/cm. is essentially 500 p.p.m. of dissolved salts and an EC of 2250 micromhos/cm. indicates the presence of about 1500 p.p.m. of dissolved salts. To those who still like to think of the solute content of water in terms of grains per gallon, it may be pointed out that one grain per gallon equals 17.1 p.p.m. A water with an EC of 750 micromhos/cm. contains about 29 grains per gallon.

Figure 1 shows the classification of irrigation waters according to both the salinity hazard, as measured by electrical conductivity, and the sodium hazard, as measured by the sodium-adsorption-ratio. This chart was developed at the U. S. Salinity Laboratory, Riverside, Calif., and is based on long years of research on irrigation waters under arid climatic conditions.

It is quite possible that this chart is too conservative for classifying irrigation waters in the humid East. For example, many areas along the Atlantic seacoast have been inundated with seawater during hurricanes or have been irrigated with brackish water from inlets leading to the sea. The sodium-adsorption-ratio of the water applied in numerous instances has been sufficiently high to indicate a very serious sodium hazard. However, winter rains have apparently been sufficient to leach out excess sodium left from use of such brackish waters. Nevertheless, where excessive amounts of salt water have covered the land or have been applied in irrigation waters, gypsum should be incorporated into the soil.

During the past few years there has been an enormous increase in the use of supplemental irrigation water in the eastern United States. Along the coast from Massachusetts to Florida, many farmers have used brackish water. Some growers have been applying water containing as much as 8000 p.p.m. of dissolved salts. As could be expected, injury to crops as evidenced by burning of the leaves or poor growth has been observed in many places. Yet, some growers report using water containing 4000 p.p.m. without apparent injury. This may be possible on such highly salt-tolerant crops as alfalfa and cotton. However, one member of the committee making this report, M. H. Gallatin, has observed serious injury to beans from overhead irrigation with water containing 1000 p.p.m. of seawater salt.

Farmers and technicians need some guides as to the limits of salinity that may be tolerated in supplemental irrigation water under a humid climate. Although insufficient data are available at this time to permit the formulation of definite standards, guiding principles can be stated.

No single threshold value may be designated below which salinity is of no concern and above which it would be hazardous. It is necessary to take into account:

(1) The texture of the soil.

Since sandy soils contain much less water per unit mass than clay soils, a given percentage of salt in the soil would be more serious in the sandy soil.

(2) The initial level of soluble salts in the soil.

It is not uncommon to find fertilizers applied at rates of one to two tons per acre on truck crops. In some instances, this high level of fertilizer application may in itself bring the salt content of a soil to the hazard level; the application of slightly brackish irrigation water may add enough salt to cause trouble.

(3) The number of applications to be made between effective leachings by rain.

Two 1-inch applications of slightly brackish water might not be sufficient to induce a salinity hazard, but if an extended drouth required five applications of such water, then salinity might cause damage.

(4) Crop being grown.

Crops vary widely in their salt tolerance. Reference should be made to page 67 of *Agriculture Handbook 60* for information on the relative salt tolerance of crop plants.

Generalizations are dangerous, but one could use the following guideposts if other data are not available:

If salinity in water is above given levels:

EC x 10^6	grains/gallon	p.p.m.	Recommendation
750	30	500	Open to suspicion
1500	60	1000	Definitely hazardous
3000	120	2000	To be avoided

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Committee on Quality of Water
M. H. GALLATIN
L. V. WILCOX
C. H. WADLEIGH, *Chairman*

Earth Slips in the Allegheny Region

(*Continued from page 30*)

Proper land use and management, drainage, and, where economically justified, deep piling, are the most important known corrective measures. It is difficult to predict where these slips will occur, and they are very difficult to stabilize.

Practices and uses which tend to induce slips should be avoided on soils which are susceptible to this type of erosion.

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Nebraska Soil Monolith Factory

HERBERT KOLLMORGEN

IT TOOK 90 SOIL monoliths to satisfy the demands of all the Work Unit Offices in Area III of the Soil Conservation Service of Nebraska. Herrold Millen, the area conservationist at Albion, Nebraska, decided on a mass production job to meet the need of his eleven Work Units. Each soil conservation district was also provided with monoliths of the predominant types of soil in that particular district.

These monoliths are thin, vertical slices of undisturbed soil, four feet deep and mounted on back boards. The slices are cut from the side of a hole dug a little more than four feet deep and wide enough for two men to work.

In the spring of 1954 Millen made a summary chart with his Work Unit Conservationists listing the types of monoliths they wanted for their district. It was found that the districts needed from six to eleven different types of monoliths. It would require 13 different kinds of soil. These would represent the major soil types in each of the districts.

How to Make a Soil Monolith

To mass-produce these monoliths Millen selected Lester D. Martelle, conservation aide of Pierce, Nebraska, to be responsible for the job. Monolith sites were chosen by Jack Young, area soil scientist at Creighton, Nebraska. Young also supervised the finishing of the monoliths and assisted with the more difficult mountings. Dave Walton, a part-time aide at Creighton, Nebraska, assisted Martelle with the entire project.

Cuting the monoliths in the field took about ten days. Finishing and boxing them took another week. They were mounted on three-eighth inch thick plywood, five inches wide and four feet long. Shallow soils over gravel or bedrock were taken to a depth of only two feet. The narrow monoliths are light and easy to handle in a meeting. They also lie flat and are easily carried in boxes. Five inch strips of felt were cut from an old rug and placed between the monoliths for protection.

This mass production job saved considerable time for the Soil Conservation Service in a number of ways. *First*, only one man had to be trained instead of one man in each of the 11 districts in the area. *Second*, only one site had to be selected for each type of soil. In other words—only 13 holes had to be dug. At several sites the men secured 12 monoliths. (They made an extra monolith of each type for the survey supervisor.) *Third*, the operations were much more efficient because experience and know-how are important to prevent numerous failures. *Fourth*, the tools, chemicals, and a place to store and finish the monoliths were available at all times. An old barn was used for storage and finishing operations. (*The strong odor of the chemicals used does not permit storage or finishing operations just anywhere.*) *Fifth*, it was possible to box and deliver a finished product, ready for use, to each of the districts. The monoliths were ready for office display or to be transported to meetings.

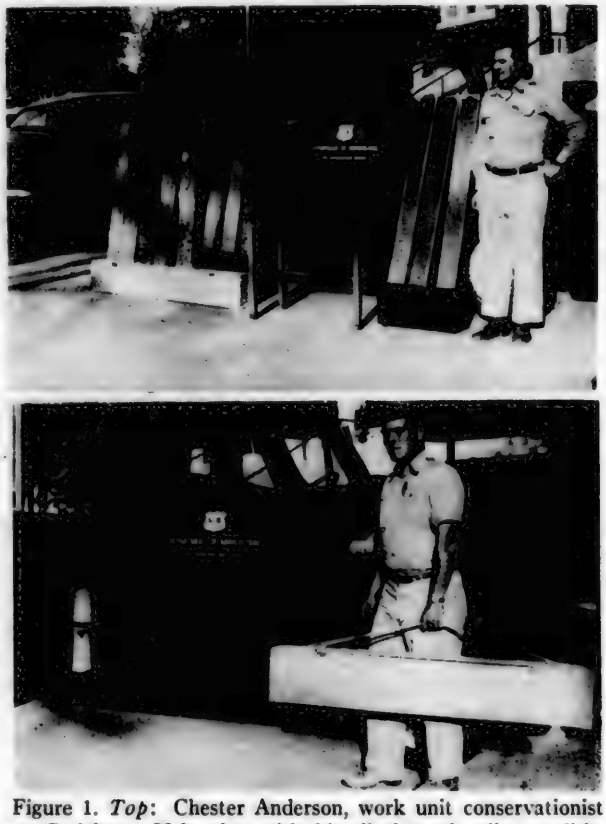

Figure 1. *Top*: Chester Anderson, work unit conservationist at Creighton, Nebraska, with his display of soil monoliths which were a part of the mass production job. *Bottom*: Jack Young, area soil scientist, showing box in which 10 soil monoliths are easily carried, transported or stored.

How Soil Monoliths are Used

Soil monoliths are used effectively in the area in many ways. They are used for office displays where they are constantly available for observation and discussion with farmers. Instead of talking to the farmers in terms of descriptive terminology about soils, these profiles make it possible to see what is being discussed. The farmer can observe the condition or problem as related to a specific kind of soil.

When displayed, monoliths arouse general curiosity

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Figure 2. This series of four protos, taken at a training school in Nebraska, shows some of the steps in making soil monoliths. *Left to right*: 1 After the pit is dug a column of the profile is carved over which a rigid iron frame is placed. 2. Front of 'framed' profile is shaved with draw knife. A smooth face is necessary to glue the monolith to the board. 3. With plywood wired and glued to frame the soil column is cut loose from side of pit. 4. Front of the monolith after it was removed from frame, dressed down, and is ready for finishing spray.

among visitors to local soil conservation offices. They prompt questions or comments about soils which may lead to giving some valuable information about management. Most any discussion of soils with monoliths will give the public a better understanding and appreciation of soil conservation work.

Monoliths are constantly being used in meetings and talks to farmers, civic groups, veterans, farm training classes, vocational agriculture classes, and in high schools and grade schools.

Soil monoliths are excellent illustrative aids in irrigation meetings for explaining water holding capacities, infiltration rates, root zones, restrictive horizons and other soil properties that affect irrigation. There are few soil and water conservation problems or practices which cannot be discussed more effectively with soil monoliths on display.

Monoliths are effective tools in training programs with technicians. They are also used to explain soil series, soil types, texture, structure and other soil properties to farmers.

Monoliths have been used for exhibits and displays at fairs, farmers days, and other agricultural affairs. They have been used to explain part of the soil judging score card at land judging schools.

Soil monoliths are worth the time and effort it takes to get them. Our experience has shown that we can do the job easier and quicker—by mass production.

The Way, The Truth, and The Life

WALTER A. FORRED

THE PROPHET, Isaiah, wrote that the day would come when men would beat their swords into plowshares and their spears into pruning hooks; nation would not lift up sword against nation, neither would they learn war any more. This was, and still is, the articulate expression of man's desire for enduring peace. However, man must not be brought to poverty or starvation by the instruments of peace. His use of the plow, pruning hook, or axe if you prefer, brings profound concern; because these instruments, improperly used, bring results as disastrous as those of war. *Within our soil is locked the health and happiness, the social and economic strength not only of our generation but of all posterity.* Regardless of man's social position or the development of his civilization he is still dependent upon food and fiber for his basic existence. Consequently, scientific farming in field and forest has matured from the thoretical dream to the fundamental principle upon which the destiny of man depends. Thus, we in this generation have ethical concerns which reach far down the future to the ages yet unborn.

Walter A. Forred is pastor of The Federated Church, Lisbon, North Dakota.

Total Stewardship in Total Life

The ethical concerns for the well-being of tomorrow's world involve the religion which men profess. This religion must be applied to every phase of man's activity. Certainly it reflects itself in the observable behavior of the individual in his relationship to society and community obligations. Jesus once said, "As a man thinketh in his heart, so is he." *Making religion practical in each phase of life makes us understand that our religion involves the practice of Total Stewardship In Total Life.*

Such a total stewardship involves our behavior in our

In September of 1954, Rev. Walter A. Forred was awarded a plaque by the Red River Chapter of The Soil Conservation Society of America for *"his efforts to advance the science and art of good land use."* Last November he was also the recipient of the award for outstanding service presented by the North Dakota Association of Soil Conservation Districts.

work as well as our worship. Certainly the use of the soil and water, as well as the other natural resources, are a part of this stewardship. That this is God's world is evidenced in many and various parts of the Holy Bible, it is affirmed by mankind as the different creeds and affirmations of faith are recited. There is not one strand of evidence which indicates that the title of ownership has changed hands. Literally, we are the land tenants for the Great God, our Father. By a similar logic we can come to see that the laws of natural science were never made by man, but were rather discovered by him as he studied and experimented to better understand God's universe about him. They are God's laws and must be treated with the same reverence which is attached to the moral code of mankind. No one can break God's laws without serious consequences either to himself or those about him; so it is that to fulfill his ethical responsibilities man must be obedient in the application of these laws in all of his behavior. This is a part of his total stewardship.

In this stewardship we must remember that "The Lord, He is God. It is He that hath made us, and not we ourselves. We are His people and the sheep of His pasture." This great philosophy of an ancient rural people began with the simile that men were the sheep and the Lord was the shepherd. This status has never changed. If we try to take over this world and operate it according to our own designs we make ourselves the shepherds and we cannot stand with David and say, "The Lord is my shepherd." In the twenty-third Psalm we affirm that God leads us through a land of green pastures and still waters. As He desires to lead us into this land, so He desires to lead future generations there also. We are not led into such a land to exploit it but to preserve and develop it. If this becomes our objective in cooperation with God, we will truly be able to say, "Surely goodness and mercy will follow me all the days of my life." The prosperity or poverty of mankind is in his own hand, and the choice is locked in his religious sincerity as he apples his affirmations to his practices.

Cooperation with God

Not only is such a mission and message directed to the farmer, but also to the technician who works with the resources. Too long have we treated these natural laws of science as something set off and apart from our moral living. Evil we quickly brand as immoral, good we readily accept as moral, but to many the laws of natural science and their use are considered amoral. Nothing can be farther from the truth. The man who is teaching another to farm by God's laws is a teacher of a better religious practice. The individual who has a tremendous concern that nothing be wasted, proclaiming tree farming, grass economy, and good land management, is a missionary preparing the way and making straight in the desert a highway for posterity. This is cooperation with God.

An interesting development among a group who decided to do something about this philosophy is now being practiced in North Dakota. At their state convention, the North Dakota Association of Soil Conservation Districts adopted a movement, known as *The North Dakota Plan,* as a part of their action program. The plan consists of seeking the assistance of the local clergy in presenting the stewardship side of the conservation program, and providing them with brochures of materials on the subject. In the past three years various ministers from different parts of the state have cooperated in the program and have made fine contributions to the cause. I wonder if this, after all, isn't the answer?

The conservation message has been projected from various angles, usually stressing the importance of the materialistic returns which come from good practices. Such a motivation, of a natural consequence, will be practiced only so far as immediate returns are visible. The selling of the total farm plan is based upon something deeper. When a man believes he is cooperating with an eternal purpose, when he feels that his efforts are to be long-lasting for his children and their children, he is more apt to see his part in a vaster part of God's program. We must help men to see that they are not only farming for today, but for all of posterity.

"This is Our Land"

A man who is doing this kind of farming is Henry J. Steinberger of Donnybrook, North Dakota. He told me about his coming to North Dakota with his mother. His father had come ahead and built a homesteading shack, and Henry and his mother came by train as far as the train ran and then proceeded the rest of the way on a hand car which took them over newly-laid section of track. His father met them at the end of the track where they boarded a wagon for the rest of the journey through

(*Continued on page* 39)

LIFE AND DEATH OF THE SOIL. By Robert C. Sherman. *Science Research Associates, Inc. 57 West Grand Avenue, Chicago 11, Illinois. 48 pages, illustrated. 60 Cents. 1955.*

This illustrated 48-page booklet, *Modern World of Science Series*, tells how abuse of soil actually destroyed an entire community which thrived on the cotton industry. This town—Audubon, Texas—simply died out when crops on the surrounding land failed because of unchecked soil erosion.

"Life and Death of the Soil" tells how nature creates soil, and what man can do to keep it from washing or blowing away. The author describes anti-erosion farming methods such as contour plowing, strip cropping, terracing, wind control, the use of fertilizer, and crop rotation.

Wind and rain carry away soil in disastrous amounts only after protective trees and plant life have been removed unwisely. Professor Sherman cites a recent Department of Agriculture report that heavy rain in California carried away 50,000 cubic yards of soil from one square mile of land where trees had been removed. The same rain took only three cubic yards of soil from the same amount of land closeby which still had its trees.

FORESTRY AND RELATED RESEARCH IN NORTH AMERICA. *Prepared by* Frank H. Kaufert and William H. Cummings *for the Society of American Foresters, Washington, D. C. 1955. 280 pages. $3.00*

Many conservationists interested in forestry will wish to browse through the results of a study of American (United States, Canada, Mexico) forest research, made by a committee representing the Society of American Foresters and the National Research Council. This study reviewed accomplishments in the quarter century since passage of the national Forest Research Act of 1928, and made recommendations and set goals for the next 25 years. It brings out that the forestry research effort has been productive with abundant and varied contributions to present forestry practices, most of which are the outgrowth of research. Not only has research paid dividends in practice, but it has stimulated the whole thinking of American forestry.

Despite progress, the effort is unsatisfactory, in terms of need. Recommended is a total expenditure by 1978 of $200,000,000 a year or 4.4 times that spent currently. Federal research is to be boosted from $9.7 to $30 million; forest school research from $1.7 to $15 million; other public agencies from $6 to $45 million, and industry from $28 to $110 million. These sums are still further broken down as between different lines of work and activities.

Of major interest to soil and water conservationists is the discussion throughout the text and in the special section on watershed management research which reviews developments and accomplishments in this field. It is pointed out that present expenditures amount to only $600,000 annually, of which 87 per cent is by the federal government, and 11 per cent by other public agencies, mostly the states or agricultural experiment stations. Although this is an increase of nine times (in terms of purchasing power) over the $40,000 spent for this purpose in 1928, it is slight by comparison with $7 million (or 11.6 times the present figure) suggested for 1978. However, the study suggests that the forest schools expand their effort 16 times, the federal government go from its present $520,000 to $13,100,000 or six times the present, and the states expand from their present $69,000 to $3,750,000 or 55 times their present expenditures. On this basis, the states would do 54 per cent of the job, and the federal government 44 per cent.

Such recommendations appear to be unrealistic in the extreme. Not only do they react unfavorably in so far as watershed research is concerned, but they cast a deep shadow of doubt upon the validity of those for other lines of work, several of which are also highly questionable. However one may react to this crystal ball gazing 25 years hence, one cannot but be struck by other features of the study, notably the personnel problem which confronts all agencies, and by the need for more research in the basic sciences of soils, plant physiology, and ecology. It is in these major fields wherein watershed management research has been particularly strong. Can it be that the reason for the outstanding progress in watershed research has been due to its recognition of the need for basic work? The reviewer believes this to be the case.

Edward N. Munns, *Concord, California*

FLOODS. By William G. Hoyt and Walter Langbein. *Princeton University Press, Princeton, New Jersey. 469 pages, illustrated. 1955. $7.50.*

The disastrous floods in the northeastern states during the past hurricane season have once again raised the question, *what can we do about floods?*

William G. Hoyt and Walter B. Langbein recently published a book entitled *Floods* which is most timely. The book is written in a style, manner, and in a language that

the average layman will understand. It is a frank discussion of all the aspects of floods, including proposals that have been made to prevent and control them.

The book is full of factual material relating to all aspects of the subject. It covers the historical floods of the Tiber, Seine and Danube rivers, a tabulation of outstanding floods in the United States showing stream, state, and date; precipitation, patterns and intensities; the relation of topography, soils and vegetal cover to floods; also a description with illustrations of the four stages leading to a flood.

The authors describe and cite examples of the many elements, including the magnitude and frequency that enters into the life of a flood, also why we have floods and how they are measured. All of these things must be studied in connection with past floods to better understand the inherent possibilities of future floods.

Floods cause estimated damages of $200,000,000 to $500,000,000 per year. This is not much in terms of our gross national product. A single flood, however, can produce severe damage and a near-paralyzing effect on any given area. The recent floods in the northeastern states give emphasis to these two points.

The early settlers were able to adapt themselves to floods by building on high ground or moving there during a flood. Many of our principal cities were located along rivers to facilitate transportation. Their subsequent growth has complicated freedom of movement and at the same time aggravated the flood problem. Several methods to alleviate the problem have been suggested and are discussed in the book. It should be emphasized that there is no cure-all to the flood problem. Zoning of land for flood use, construction of dikes and levies, channel improvement, reservoirs and land use practices have their place alone or in combination in offering ways to reduce flood damage.

The people living on the flood plains and those flood-conscious citizens who have a sincere interest in the flood problem will find the book most interesting and fascinating. Professional workers will also appreciate the frank discussion of the many technical and controversial aspects of floods.

MACHINES OF PLENTY, pioneering in American Agriculture. BY STEWART H. HOLBROOK. *The MacMillan Company, 60 Fifth Avenue, New York 11, N. Y. 246 pages. 1955. $4.00.*

This book centers its interest on a fundamental aspect of our national life—the American rural scene and the farmer who feeds the nation and a good part of the world. The development of the great wheat fields of the West, improvements in farm machinery and methods, as well as in the farmer's life, during the past century and a quarter are recounted in the lively and realistic manner which

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Some Recent Books

Topsoil and Civilization. BY TOM DALE AND VERNON GILL CARTER. *University of Oklahoma Press, Norman, Oklahoma. 270 pages, illustrated. 1955. $3.95.*

Man and the Winds. BY E. AUBERT DE LA RUE. *Philosophical Library Inc., 15 East 42nd St., New York. 206 pages, 1955.*

Soil Physics—*Third Edition.* L. D. BAVER. *John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N.Y. 489 pages, illustrated. $7.75. 1956.*

The Way, The Truth, and The Life

(*Continued from page 36*)

high prairie grass. The father kept telling the mother that this was not a house like she had left as they drove toward the claim. Repeatedly he reminded her that this was the first land which they had owned. Upon arrival the father lifted Henry off the wagon and then reached up to lift the mother down. Holding her in his arms, he said, "Before I put you on this ground I want you to know that this is our land." He then placed this courageous woman on the ground and they all danced around a circle singing, "This is our land, this is our land." Mr. Steinberger was a good farmer and later Henry was to own that same farm; now Henry's son is farming his grandfather's homestead claim. They are farming it in total compliance with the idea that they are the stewards of God's land. Henry has grown up from being a boy now, and he and his son have come to know that this isn't their land but rather their stewardship. As examples like this spread across the thinking of our people who are directly involved with the resources of our country, and as they apply their religion to the practices they employ, more and more we will all be able to say, "Surely goodness and mercy shall follow me all the days of my life."

Such a way of life will only come as men learn how to use the axe, the plow, and the pruning hook. Understanding that the green pastures and quiet waters are not only to be devoured, but maintained, and knowing that scientific farming of field and forest is the higher moral way, teachers, technicians, and users of the land following this principle feel the vitality of their religion in life. They come to understand it as part of "the cup which runs over." To them it is the evidence of the restored soul. It is the picture of God and Man building together for now and posterity too. This is "the way, the truth, and the life."

Where Have We Been?

(*Continued from page 27*)

"Every one of us has a stake in the soil of this country and in what grows on it. And every one of us needs to be better educated as to what can and should be done with the soil to the end that this great land of ours grows ever more beautiful and productive. It is to the accomplishment of these educational and functional ends that the Society is dedicated.

"The more progressive chapters have regular meetings that bind the members together in their common effort to put conservation on the land in their respective states. The national meetings complement the chapter meetings by permitting those in attendance to view the soil, water, and life problems of the nation as a whole. The chapters think in terms of their pieces of the problem. The national Society is concerned with all the land, wherever it may be and whatever should be done with it. And it reaches out to other nations as well.

"Leadership in soil, water, and life conservation requires evangelism of a high order. And, in proportion as more members of the Society dedicate their lives to the solution of the problems involved, the higher the hope for accomplishment of improved land use in this country. Each of us should ask himself the question, 'Am I doing my duty as a member of the Society?' Each of us must deal with his own conscience in this connection. Hopefully, his conscience is clear."

The men who founded the Society are still active. It would be interesting to have their reaction to this article. Have we reached the heights they envisioned for the first ten years? Where have we failed? Has the Society the proper impact on resource use? The answers, and I hope many are received from any who feel inclined to write, will probably vary but in the variance will be our path.

Every member can be proud that today the Society is an active group in American conservation. It can be all the founders desired. We have members from all phases of the land use movement. Probably we can modestly say that no other conservation organization has such a distinguished and comprehensive membership. Our very purpose for existence is basic to other fields of related interest. The Society offers the conservationist the opportunity to improve himself, to be a leader, to share with others and to gain from them. To maintain its vitality the Society needs your opinions, your research, your new methods, your new techniques and above all your interest and enthusiasm. With your help as a member, the Society will advance the science and art of good land use.

Field Notes

Land Judging Contests Are Scheduled

The Fifth National Land Judging and the Second National Range and Pasture Judging Contests will be held May 4, 1956, at the State Fairgrounds, Oklahoma City, Oklahoma. This contest is sponsored by Station WKY AM-TV and business men of Oklahoma City.

On May 3, 1956, a detailed school of instruction is scheduled for both the land and the range and pasture judging contests for all out-of-state participants who wish to make a study of soil and pasture conditions in Oklahoma.

There will be five divisions for contestants: 4-H, FFA, women and girls, collegiate, and adults. Awards in the form of money, medals, trophies, and plaques will be presented the contest winners.

Further information concerning these events may be obtained from Jack Stratton, Farm Director of Radio Station WKY, Oklahoma City, Oklahoma.

In The News

DeWitt Nelson of Sacramento, California, was recently elected as president of the Society of American Foresters by mail ballot of the members for the two-year term 1956-1957. He succeeds Elwood L. Demmon, of Asheville, North Carolina.

George A. Garratt of New Haven, Connecticut, dean of the Yale University School of Forestry, was elected vice president of the Society.

Organized in 1900, the Society of American Foresters with headquarters in Washington, D. C., has a membership of almost 11,000 professional foresters practicing in the United States and Canada. Its governing body is the Council composed of the president, vice president, and nine additional members.

Dr. Cecil H. Wadleigh, career scientist and administrator of the United States Department of Agriculture was recently named chief, Soil and Water Conservation Research Branch, by Dr. Byron T. Shaw, administrator of the Department's Agricultural Research Service. Dr. Wadleigh fills a position that has been vacant since the death of Dr. Robert M. Salter.

In his new post, Dr. Wadleigh will direct and coordinate USDA soils research in 41 States, representing all important soils regions of the U. S. Headquarters of his Branch are at Beltsville, Maryland.

Prior to this appointment, Dr. Wadleigh served in the Soil and Water Conservation Research Branch as head of the Section of Soil and Plant Relations, a post he has held since the formation of the Section in 1954.

In his nearly 15 years with the department, he has also served as a scientist at the U. S. Salinity Laboratory, Riverside, California, and from 1951 until 1954 he was head of the Division of Sugar Plant Investigations at Beltsville.

Soil and Water Conservation Advisory Committee Appointed

Ezra Taft Benson, Secretary of Agriculture, recently

These two unusual photos were submitted to the JOURNAL by R. G. Downes, Deputy Chairman, Soil Conservation Authority, Victoria, Australia. Mr. Downes spent a year in the States studying an dsurveying conservation programs. He also attended the Soil Conservation Society of America meeting held at Jacksonville, Florida, in 1954. The photos show two different display techniques. The one on the *left* is a dripometer and shows visually what happens when water drips on barren soil or grass. *Right*: A wind tunnel to show what wind does to unprotected soil. "These exhibits," reported Mr. Downes, "were extremely effective in creating interest among Australians in soil and water problems."

"This farm is leaving by air express!"

formed an Advisory Committee on Soil and Water Conservation to function on a continuing basis. The first meeting of the 18-member committee was held last October 27 and 28.

In selecting membership for the committee, the Department of Agriculture asked the advice and counsel of organizations most directly concerned with conservation to suggest names of individuals to be considered for membership on the committee. From those suggestions, the following individuals accepted appointment:

Leo L. Anderson, member, board of directors, Sexauer Seed Company, Fargo, North Dakota; *Earl Bower,* officer, Wyoming Water Resources Board, Worland, Wyoming; *R. Edward Baur,* director, National Association of Soil Conservation Districts, Van Meter, Iowa; *Dr. Firman E. Bear,* retired chairman, Soils Department, Rutgers University, New Brunswick, New Jersey; *George D. Clyde,* Commissioner of Interstate Streams, Utah Water and Power Board, Salt Lake City, Utah; *Bill Durham,* farm editor, Fort Worth Star Telegram, Fort Worth, Texas; *Charles J. Elliott,* former president, Illinois Agricultural Association, Streator, Illinois; *L. W. Garver,* chairman, Farm Equipment Institute, Soil and Water Conservation Committee, Racine, Wisconsin; *L. Roy Hawes,* Commissioner of Agriculture for the Commonwealth of Massachusetts, Sudbury, Massachusetts; *T. R. Hodges,* former chairman, Washington Association of Soil Conservation Districts, Waterville, Washington; *Tom Hitch,* president, Tennessee Farm Bureau Federation, Columbia, Tennessee; *A. D. Holmes, Jr.,* Area vice-president, National Association of Soil Conservation Districts, Gallion, Alabama; *Mrs. Katharine Jackson Lee,* chairman, New Hampshire Natural Resources Council, Peterborough, New Hampshire; *L. L. Males,* secretary-treasurer, Washita Valley Flood Control Council, Cheyenne, Oklahoma; *Raymond A. McConnell,* editor, *Nebraska State Journal,* Lincoln, Nebraska; *Wade Newbegin,* president, R. M. Wago & Co., Portland, Oregon; *William Rosecrans,* chairman, California Board of Forestry, Los Angeles, California; *Carl Shoemaker,* conservation consultant, National Wildlife Federation, Washington, D. C.

"Soil and water conservation activities constitute a substantial part of the department's total program and service to agriculture," Secretary Benson said. "It is our desire that the Soil and Water Conservation Advisory Committee function on a continuing basis to advise me, my staff, and Department agencies dealing with soil and water conservation programs."

Membership on the Advisory Committee will be for three years, with membership so staggered that one-third of the members will be new each year. The Advisory Committee will be asked to meet at least once each year, and at such other occasions as may be mutually found desirable.

Daily TV Show Features Conservation

Vermont's television station WCAX-TV, operating on Channel 3, with service also to neighboring New York, New Hampshire and Canada, devotes attention to soil conservation regularly as an important part of the agricultural program "Across The Fence." Kenneth Wilson, Vermont State Soil Conservation Engineer, is shown demonstrating the use of tile in soil drainage while Lloyd Williams, master of ceremonies, looks on. "Across The Fence" is presented as a public service daily at noon, Monday through Friday, with the cooperation of the University of Vermont College of Agriculture and the Vermont Extension Service.

Chester W. Gee Dies in Milwaukee Hospital

Chester W. Gee, an active member of the SCSA, died in a Milwaukee hospital on November 13 from complications following an operation. He was associated with the Bert S. Gittins Advertising Agency at the time of his death.

He was a graduate of Kansas Wesleyan University and worked for 17 years as farm news editor on the Wichita, *Kansas Eagle* and the *Salina Journal*. In 1942 he joined the U. S. Navy and was associate editor of the *Naval Aviation News*.

In 1946 he came with the U. S. Conservation Service as assistant chief of the regional information division and head of the current information section at Milwaukee. He became chief of the division in 1951 and held that position until 1954 when he joined the staff of the Bert S. Gittins Advertising Agency in Milwaukee.

"Chet," as he was known to his many friends, wrote the *Creed of the Soil Conservationist*. It was translated into many languages and used by thousands of people all over the world.

I believe God created the earth by His divine processes for the benefit of man, not one man, nor one generation, but mankind for all time.

I believe the Almighty gave man an inheritance of the earth, not to be hoarded as a miser guards his treasure, but to be used with wisdom and in the fullest for the perpetual benefit of all men.

I believe all mankind, regardless of race or creed, are entitled to a fair and equitable share of the earth's bounty commensurate with their own efforts. But in so believing, I hold the irrevocable conviction that man himself owes earth a debt of respect and fealty.

I believe that whatsoever a man soweth, that shall he also reap; that he who manages his fields, pastures, woodlands, and streams with respect and wisdom shall reap the bountiful harvest and so shall his descendants while he who uses them selfishly, thinking only of his own immediate gain, shall bring to grief his land, himself, and his children's children.

Holding these beliefs to be true I dedicate myself to the task of helping my fellow men realize their own personal responsibility in conserving the earth for the generations which follow them. To this end I shall devote my best knowledge in guiding the efforts of those who till the soil so that the land which nurtures us shall be fruitful without end.

PUTTING THE BRAKES ON WATER AND WIND
Protect your soil against loss from water and wind by using quality mixed fertilizer for healthy growth of good pastures, range grasses, legumes and grains.
Use International Fertilizers in your soil conservation program. You can get them in all locally recommended regular and multiple strength grades. Whichever you choose, you'll get a balanced combination of rich, crop-producing plant foods... for Satisfaction at Harvest Time.
in regular and multiple strength grades
International
INTERNATIONAL MINERALS & CHEMICAL CORPORATION

For truly, the earth is the Lord's and the fullness thereof, but the responsibility for its stewardship is vested in man.

Watershed Congress Considers Local, State and Federal Responsibilities

The Second National Watershed Congress met in Washington on December 5-6, 1955 and heard round table discussions on four topics as well as several papers. It was sponsored by 25 farm, business and labor organizations. The four topics, each covering a session of the Congress, were entitled: Committee I—*Elements of the Job*, Committee II—*Federal Responsibilities*, Committee III—*State Responsibilities*, and Committee IV—*Local Responsibilities*.

Presidential Assistant Sherman Adams addressed the banquet meeting on the opening day. He pointed out the Government will be a "useful servant" in helping to solve water problems in the nation. But he said that Federal control of water in the nation ultimately would mean "control of the whole economy." He also indicated that a national water policy under study by the Administration for nearly two years probably will be ready for the next session of Congress.

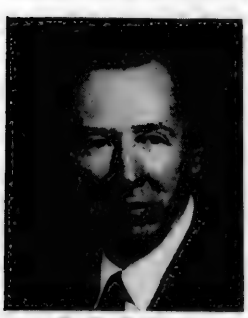
News Notes

President's Column

To all members of the Society:

The publication you hold in your hands starts the second decade in the history of the JOURNAL. It is tangible evidence of a vigorous organization. The record-breaking annual meeting at Green Lake was another sign of the healthy condition of the Society. The increasing activity of chapters and the unselfish work of the many Committee members express the same determined effort to see to it that things are done to *advance the science and art of good land use*. This year of 1956 already poses problems, of course, but they are dwarfed by the promise of great expectations. Not the least of these is the 1956 meeting at Tulsa, October 15-17. It's not too early to mark that on your calendar. Myron Hurd's committee on arrangements and Bill Endersbee, with his annual meeting program committee, are not letting any grass grow under their feet.

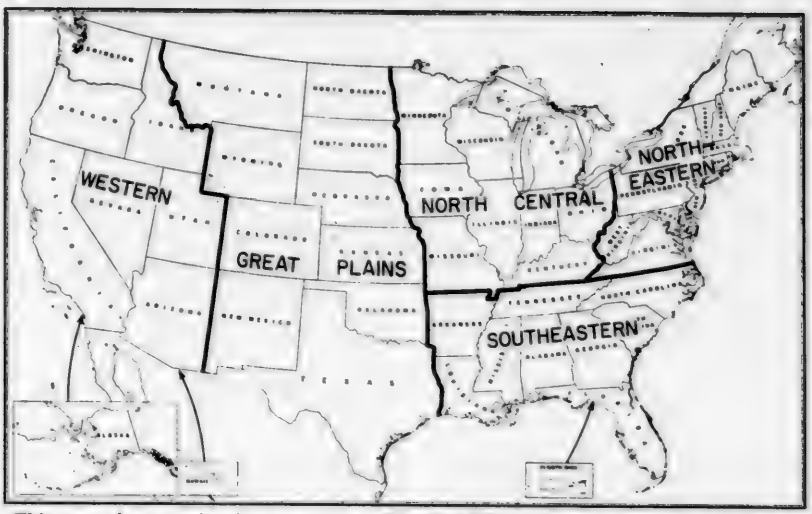
And speaking of the Green Lake meeting, one of the things I liked about it was the large contingent of ladies who met with us. We should have more ladies at all our meetings, and there should be many more of them numbered among our members. It seems to me that the SCSA could add much to its strength by having more women, professional and non-professional, in its ranks. In teaching, research, administration, personnel, information, publication, and many other phases of land-use work there are professional women who should be members. Among non-professionals there is enthusiasm and support among women interested in conservation that we can ill afford to be without. And I am not thinking of women in an auxiliary capacity, but as an integrated functioning part of our whole Society organization. I for one am for far larger representation of the fair sex in the SCSA.



E. H. Graham

In planning for 1956 and the years ahead, I thought you might like to consider the possibilities of the rather new regional organization of the Society, outlined in the adjacent map. As you know, there will ultimately be representation on the Council from each of these five regions, with the other three of the eight Councilmen elected at large. The first of the regionally elected Councilmen is Herbert A. Hopper of Lafayette, California, taking office this year as the Western representative. In the future, regional Councilmen will be elected by vote of members from their respective regions. At present there is unequal geographic representation on the Council. Bear, Edminster, and Williams are from the Northeast; the 1956 President, and the immediate Past President, who serves on the Council for one year, are also from the Northeast. In the North Central Region, Sauer and Wilson are Councilmen, with that region contributing also the First and Second Vice Presidents and the Treasurer. The Great Plains has two Councilmen, Young and Chambers. The Southeast alone has no representation this year on the Council of the Society.

(*Continued on page* 44)



This map shows regional organization of the Soil Conservation Society of America as adopted by the membership in 1954.

North Carolina Leads The Nation

The membership report by Harold Rhodes, national membership chairman, made at the Green Lake meeting was for 10 months due to the early convention. The record for 1955 was not as good as 1954 and a slight decrease was reported. By October 1, 1955, the records were again in balance and *Society* membership held an even position for the year. A high number of drops resulted from increasing the former $3.00 dues to $5.00.

On August 15, 1955, the *Society* had 5,717 members as compared to 6,009 on October 1, 1954. Prior to dropping the delinquents on July 1, 1955, the *Society* carried over 7,100 on the membership rolls.

North Carolina ranked first in gain and at the time of the Green Lake meeting had secured 103 new members since October 1, 1954. Since the Green Lake meeting they have added another 50 members. Secretary of the North Carolina Chapter, Joe R. Adair, was at Green Lake to receive the plaque presented to the chapter with outstanding membership development record.

Membership by states and countries on August 15, 1955, was as follows:

N. C.	298	Ky.	130
Iowa	268	Okla.	119
Mich.	243	N. Dak.	118
Wisc.	234	S. Dak.	113
W. Va.	233	Va.	106
Tex.	192	Minn.	102
Nebr.	182	O.	100
Calif.	180	N. J.	88
Kan.	179	Wash.	85
Md.	176	Ga.	75
Ill.	169	Ind.	70
N. Y.	169	Ariz.	61
Ala.	158	Mo.	58
Penn.	157	Ore.	54
Fla.	148	Miss.	53
S. C.	145	Tenn.	52
Colo.	139	Ut.	49

(*Continued on page* 45)

President's Column

(*Continued from page* 43)

As we move ahead over the next few years elections will provide more even geographic distribution of member representation on the Council. According to our revised Constitution, each region will ultimately elect one regional Council member every three years.

This regionalization of the Society has more significance, of course, than representation on the Council, however important that may be. In committee and other national assignments it provides a guide to more equable distribution of membership responsibilities. It can serve also as a guide for the closer integration of inter-Chapter activities, for there is likely to be regional community of interest and concern with land and water problems over a portion of the country having broad geographic similarities. Perhaps there might be a strengthening of Chapter function through regional rivalry, competition, cooperation, or some joint endeavor. I cannot help but wonder where the first regional meeting will be held. Far from dissipating interest in an attendance at our national meetings it seems to me that meetings of regional character, timed and correlated with other regional meetings and with the national conclave, may add further purpose and vitality to the Soil Conservation Society of America. In recognizing those who have meritorious accomplishment to their credit, the regions of the Society may serve a very useful purpose, for many types of awards might most appropriately be made on a regional basis. Some of these things are far ahead of us, I suppose, and I hope there will never be hard and fast lines drawn, but you may want to give thought to possible opportunities that exist in the regionalization that the Society has now provided its members.

I look forward through this column to discussing with you in forthcoming issues of the JOURNAL other matters of concern to our Society. I should be glad to hear from you on subjects mentioned here or other Society items you wish to write about. I want you all to know that the officers of the Society and other members of the Council are most anxious to serve in conformance with the wishes of the membership, and we welcome words of suggestion, encouragement, criticism, or rebuke, for out of all of them comes the give and take that can make the Soil Conservation Society of America a more vital and effective force for good land use.

EDWARD H. GRAHAM, *President*

New Desk Emblem Set Available

Requests have frequently reached the national office for suitable awards or gifts that might be presented to members or friends. For several years plaques, rings, buttons, tie clasps have been available. At the request of the East Texas Chapter a desk set with the Society emblem prominent in the background is now available.

Orders should be mailed to the national office. The sets are priced at $17 with an Esterbrook pen or $25 with a Sheaffer's pen. A limited supply of each set is maintained in the national office for quick shipment. The base is of walnut and is illustrated above. Engraving on the plate is seven cents a letter.

11th Annual Meeting in Tulsa, Oct. 15, 16, 17, 1956

A delegation from Oklahoma had an exhibit at Green Lake, Wisconsin, to encourage attendance at the 1956 annual meeting in Tulsa. Pictured above are: back row, left to right: Eric R. Hurd, Claremore, Oklahoma; Myron A. Hurd, Claremore, Oklahoma, and chairman of 1956 local arrangements committee; Harley A. Daniel, Guthrie, Oklahoma.; Edd Roberts, Stillwater, Oklahoma; K. C. Bennett, Miami, Oklahoma; Front row, left to right: Mrs. Myron Hurd, Claremore, Oklahoma; Mrs. Edd Roberts, Stillwater, Oklahoma; Mrs. K. C. Bennett, Miami, Oklahoma.

Quotes on Annual Meeting

HERBERT A. HOPPER, California—"I thought the recently concluded annual meeting was the finest I have ever been privileged to attend or have heard reports about. The arrangements were excellent and the program was outstanding."

E. D. BOLTON, Nacogdoches, Texas—"I want to tell you how much we enjoyed the annual meeting in Green Lake. To me the program was excellent. I feel that any member misses an awful lot by not attending the annual meeting. We are looking forward to another big meeting in Tulsa next year, and I assure you one thing, the Boltons will not be introduced as "foreigners." We will have a really large representation at this meeting. Mrs. Bolton joins me in expressing our thanks for a most worthwhile meeting."

GEORGE SHARPE, Morgantown, West Virginia—"Without a doubt, I would like to say that the meeting at Green Lake was the finest and most inspirational meeting for our *Society* that I have attended. Consideration might be given for Green Lake or some similiar area to be a permanent national meeting place. The expenses were reasonable and the setting was wonderful."

E. C. SACKRIDER, East Lansing, Michigan—"I was real enthused with the Green Lake meeting. It was excellent not only from the standpoint of attendance but from the standpoint of subject matter. This meeting is going to give the new officers and council something to shoot at. Michigan had more than 60 registered for the meeting and all seem to be in full agreement that it was a very worthwhile meeting."

(Secretary's Note: Thanks to the Wisconsin people for their work in making the meeting a success.

University of Michigan Student Chapter News

After appointment of temporary steering committee, a series of programs was planned for the first semester work of the student chapter. The programs were in the form of weekly seminars, exploring the relationship between conservation and allied fields of study. The schedule for the fall sessions was as follows:

October 14—"The Study of Natural Communities and Its Significance to Conservation," Francis C. Evans, Department of Zoology; October 21—"The Relationship of Wildlife Management to Soil Conservation," Warren Chase, Department of Wildlife Management; October 28—"The Great Lakes Research Institute and Its Activities," David Chandler, Department of Zoology; November 4—"The Itasca State Management Program and Its Effect Upon Policy Formation," Stephen Spurr, Department of Forestry; November 18—"Ground Water and Conservation," James Zumberge, Department of Geology; December 2—"The Role of the Forester in Watershed Management," Robert Dils, Department of Forestry.

Andrew J. W. Scheffey is serving as chairman of the student chapter, Paul Kilburn as secretary and Bernard Clausen as treasurer.

North Carolina Chapter Active

North Carolina Chapter members held their annual meeting at Statesville, on November 11 and 12. They celebrated the fact they were the No. 1 chapter in the nation as far as membership was concerned. Chapter members were particularly proud of the fact that 100 per cent of the 33 directors of Abbotts Creek Watershed Association were members of the Society. This is the first watershed association to have all of its directors as members of the Society.

The meeting was called to order by Stanley Z. Pollock, chairman, and the afternoon session of the first day was spent on a tour of the Third Creek Watershed where work was proceeding under Public Law 566.

A demonstration of soil sampling was given by Iredell County 4-H Club members.

For the annual banquet Dr. H. H. Bennett, Founder of the Society and past president, spoke on "The Future of Soil and Water Conservation."

Harry B. Caldwell, Master North Carolina Grange, presented, on behalf of the chapter, plaques to Rev. Garland A. Hendricks and to George L. Winchester for outstanding work in soil and water conservation.

On Saturday morning a business session was held during which time several items of importance were discussed including a report of the national meeting by Joe Adair, reports on membership and activities, by sectional chairmen.

Prior to the meeting a mail ballot was distributed and it was announced that R. B. Bailey was elected chairman; J. B. Newman, secretary; Louis E. Aull, first vice president; John C. Boyter; second vice president; John R. Herman, S. Vernon Stevens, Staton McIver, council members.

At the noon luncheon, H. Wayne Pritchard, executive secretary of the Society, discussed the organization and the work it is doing.

Membership

(*Continued from page* 43)

Mont.	48	Nev.	12
Ark.	47	R. I.	10
New. M.	47	Del.	8
Conn.	34	D. C.	98
Mass.	33	P. R.	18
Me.	28	H. I.	10
Vt.	26	Alas.	1
Id.	25	Can.	113
La.	19	For.	243
N. H.	19	Stud.	159
Wyo.	16		

Of interest to many will be the record of membership in Canada: Ontario 76, Quebec 4, Saskatchewan 11, Manitoba 8, British Columbia 3, Nova Scotia 3, Alberta 7, New Brunswick 1.

Foreign membership is as follows: Pakistan 6, India 17, Thailand 2, Israel 14, Turkey 4, Lebanon 1, Iran 1, Mexico 5, Costa Rico 1, El Salvador 2, Honduras 1, Southern Rhodesia 19, South Africa 8, French West Africa 1, Algeria 1, Kenya 2, Madagascar 3, Gold Coast 2, East Africa 1.

Philippines 5, Indonesia 1, Ceylon 2, Korea 2, Formosa 9, Japan 2, Malaya 1, Brazil 9, Peru 6, Colombia 6, Uruguay 3, Argentina 2, Venezuela 2, Chile 4.

Holland 10, North Wales 1, Poland 1, Switzerland 1, Yugoslavia 2, Sweden 1, Italy 6, Spain 3, Russia 5, Belgium 2, Scotland 1, France 4, England 3, S.Z. Germany 8, Greece 2, Austria 1, Czechoslovakia 1, Cyprus 1, Australia 12, New Zealand 15, Fiji Islands 1, Haiti 2, Jamaica 3, Trinidad 1, A.P.O. 10.

435,000 Copies of Society's "Story of Land" Used

Over 250 soil conservation districts have used "The Story of Land" to tell the conservation story. The four-color booklet, introduced by the *Society* has now been printed three times since June 1, 1955; 510,000 copies have been produced and 435,000 copies have been distributed.

Orders for the booklet have been received from throughout the world. A small order was sent to Divisional Forest Officer of Mirpur, Azak Kashmir, Pakistan. Just received is an order for 10,000 copies to be sent to the Natural Resources Board of Southern Rhodesia at Salisbury in that country.

Chapters and members are encouragd to promote the distribution in every way possible. Most of the purchasers use the back page to tell their story.

Sales of 1,000 or more booklets made since the list was printed in the September JOURNAL are as follows:

Jackson County SCD, Altus, Okla.	1,000
Lawrence County SCD, Lawrenceville, Ill.	1,500
Floyd C. Price & Sons, Selma, N. Car.	1,000
W. D. Franklin, Clinton, Ky.	1,000
Davison Co. SCD, Mitchell, S. Dak.	3,300
Maryland State Soil Conservation Committee, College Park, Md.	20,000
Gaylord Farm Sanatorium, Wallingford, Conn.	1,000
Thornapple-Grand SCD, Charlotte, Mich.	1,000
Bank of Berkeley, Moncks Corner, S. Car.	3,000
Willard Cook, DeKalb, Ill.	1,000
Longmont SCD, Longmont, Colo.	1,000
No. Dak. Assoc. of Soil Conservation Districts, Bismarck, N. Dak.	20,000
Atlanta SCD, Decatur, Ga.	1,000
Ohio State University, Columbus, Ohio	1,000
East Alabama SCD, Opelika, Ala.	3,000
Adair Co. SCD, Columbia, Ky.	2,000
Douglas L. Pope, Albany, Ga.	1,000
Upper West Ford SCD, Jacksboro, Tex.	1,000
Wood County SCD, Wisconsin Rapids, Wis.	1,500
Washington County SCD, Hagerstown, Md.	10,000
Conecuh County Exchange, Inc., Evergreen, Ala.	1,000
Morgan County SCD, Jacksonville, Ill.	1,000
Randolph County SCD, Sparta, Ill.	1,000
Marion-Cass SCD, Atlanta, Texas	2,000
Holley Tractor & Equipment Co., Inc., Aiken, S. Car.	1,000
Wexford Co. SCD, Cadillac, Mich.	1,000
Paul B. Cassell, Blackstone, Va.	1,000
Pacific Power & Light Co., Albany, Ore.	1,000
Philadelphia Electric Co., Philadelphia, Pa.	2,000
Tradewater SCD, Dawson Springs, Ky.	2,000
Soil Conservation Service, Birmingham, Ala.	1,200
Montgomery Co. SCD, Troy, N. Car.	3,000
Box Butte Co. SCD, Alliance, Nebr.	1,000
Roosevelt County SCD, Culbertson, Mont.	1,000
Grand Traverse SCD, Traverse City, Mich.	1,000
Livingston Co. SCD, Smithland, Ky.	1,000
Johnson County SCD, Olathe, Kans.	1,000
Mansel Wolf, Scottsboro, Ala.	1,000
Iowa Co. SCD, Dodgeville, Wisc.	1,500
East Allegan SCD, Allegan, Mich.	2,300
Midcontinent Distributing Company, Des Moines, Ia.	1,000
Equitable Life Insurance Company, Des Moines, Ia.	1,000
Dukehart-Hughes Tractor & Equip. Co., Des Moines, Ia.	1,000
Atlanta SCD, Decatur, Ga.	1,000
DeKalb Co. SCD, DeKalb, Ill.	1,000
Adams-McCargo Motor Co., Anniston, Ala.	1,000
Natural Resources Board, Salisbury, S. Rhodesia	10,000
University of Maryland, College Park, Md.	2,700
Union National Bank of Rochester, Rochester, Minn.	2,050
Lower Chattahooche River, SCD, Smithville, Ga.	1,100
Polk SCD, Lakeland, Fla.	5,000
Clark Co. SCD, Springfield, Ohio	1,300
Laboratory Distributors, Inc., L. A., Calif.	6,000
U.S.D.A., S.C.S., Washington, D. C.	1,000
Coastal Plan SCD, Hookerton, N. C.	2,200
Antrim Co. SCD, Bellaire, Mich.	1,000
Wis. State Soils Cons. Com., Madison, Wis.	1,000
Wash. Co. SCD, Stillwater, Minn.	1,000
Northumberland Co., SCD, Sunbury, Pa.	1,000
Prairie SCD, Fowler, Ind.	1,000
Burlington Co. SCD, Mt. Holly, N. J.	2,200
Elmo Jones, Goodwell, Okla.	1,000
Christian Co. SCD, Hopkinsville, Ky.	10,000
Bank of W. Baton Rouge, Port Allen, La.	1,250
Fergus Falls Prod. Credit Assoc., Fergus Falls, Minn.	1,500
Saline Co. SCD, Salina, Kan.	1,000
Wayne Co. SCD, Wooster, Ohio	1,200
Kankakee Co. SCD, Kankakee, Ill.	1,000
Green Co. SCD, Greensburg, Ky.	1,000
Delbert R. Wood, Stuart, Va.	1,100
Lawrence SCD, Spearfish, S. Dak.	1,000
Stanton SCD, Stanton, Nebr.	1,000
Webster Co. SCD, Dixon, Ky.	1,000
Cimarron Co. SCD, Boise City, Okla.	1,000
Minnehaha SCD, Sioux Falls, S. Dak.	1,000
North Side SCD, Jerome, Idaho	1,200

New Jersey Shish-ka-bob

The fall meeting of the New Jersey Chapter SCSA was held on the Ernest Peterson farm near Allentown on October 27. The program was as follows:

"Concrete Drop Spillways and Water Storage," Kenneth Werkman, State Engineer, Soil Conservation Service, U. S. Department of Agriculture; "Surface Water Supplies," Gordon S. Hayes, Hydrologic Engineer, Surface Water Branch, Water Resources Division, Geological Survey, U. S. Department of the Interior; "Underground Water Supplies," Dr. Kembel Widmer, Principal Geologist, N. J. Geological Survey, N. J. Department of Conservation and Economic Development; "Report on Water Intake Rates of Dug Ponds," Neal Munch, Soil Conservation Service, U. S. Department of Agriculture; "Watershed Studies—Lebanon State Forest," Henry C. Barksdale, District Water Engineer, Ground Waters Division, Geological Survey, U. S. Department of the Interior.

The group toured the Peterson farm, the Coleman Totten farm and the Lebanon State Forest. A Shish-ka-bob at the saw mill at Lebanon State Forest was enjoyed at mid-day.

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Traction Booster, with remote ram principle, enables the WD-45 Tractor to handle the new big-capacity, 4-disc plow with mounted-implement ease. The 26 or 28-inch blades, with almost 400 pounds of weight on each, make this tool ideal for building terraces. The single-point, free-swing hitch makes it easy to handle on contours without side-draft, and at speeds equal to those on level land. SNAP-COUPLER hitch makes "get-ready" faster, easier, and safer.

ALLIS-CHALMERS tractors and implements have long been pacemakers in conservation farming. Tractor-mounted tools, hydraulically controlled, provide easy transport over grassed waterways. The free-swing hitch permits implements to follow contours easily. And many other design features aid grassland farming and erosion control.

Now Allis-Chalmers announces a new fundamental advancement that increases the WD-45 Tractor's work capacity by as much as 50 percent through the use of larger, wheel-transported implements, which operate with all the advantages and conveniences of fully-mounted implements.

The development of a new remote-ram principle extends the use of the Allis-Chalmers Traction Booster system of the WD-45 Tractor to a newly-introduced line of big-capacity, wheel-transported implements, including a heavy-duty 4-disc plow, and 10-ft. and 12½-ft. double-action disc harrows.

With this new equipment, conservation farmers can now do *more* work in *less* time at *lower* cost . . . for more efficient farming and better conservation in the years ahead.

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Florida Chapter Meets

Meeting for the first time since the national meeting was held in Florida late in 1954, the Florida Chapter sponsored a very successful meeting at Pensacola on October 7-8. The meeting was opened by Bert F. Karick, chairman of the Florida Chapter. During the afternoon session Commander Peter Corradi, Public Works Officer, Sixth Naval District, discussed "The Sixth Naval District's Soil Conservation Program." He stated many of their problems were caused by large areas where water runs off into surrounding areas during rains. He also mentioned the matter of wind erosion caused by propeller and jet blasts. He told of corrective measures taken and of working with soil conservation service personnel, foresters, agronomists and soil scientists at Whiting Field near Milton, Florida.

Representative Bob Sikes, Congressman, Third District, of Florida spoke at the evening session. He discussed the farm problem and stated: "This country is plagued by great surpluses of farm products, but it is a mistake to hold them in warehouses instead of putting them into world markets." Sikes pointed out that the last Congress authorized a budget of 64 billion dollars, about half of which is for defense. Another fourth, he said, is payment of previous wars and only 3.4 billion dollars was allotted for agriculture in all its phases.

He said, "The government cannot take care of all the farmers' problems, however, farmers must be helped to work for their own salvation and conservation is a big part in that. Forestry provides a great opportunity. There are 3½ million acres of wasteland in Florida that can be converted to trees, grasses, or poultry."

At the business session E. Loy Strickland of Bushnell was elected chairman; John W. Hampton, Lake Butler, vice chairman; Howard A. Mathews, Tallahassee, secretary. The following were elected to the council: John B. Cromartie, DeFuniak Springs; Reid Powell, Mayo; William S. Haas, Starke; John D. Griffin, Palatka; Walter W. Shaffer, Tavares; C. B. Blickensderfer, Sarasota; O. S. Polston, Sebring; Bert Karick, DeFuniak Springs.

Ramser Likes Journal

". . . I feel that I have been in close touch with soil conservation activities throughout the past year through the splendid and comprehensive coverage in the JOURNAL. Mr. Gumbel, the editor, deserves special commendation for the high standards maintained in selecting, editing, and illustrating the inviting and instructive articles invariably found in this unique publication.

"In my opinion the JOURNAL is one of the few attractive and worthwhile publications in the field of technical literature. I was sorry to learn of Mr. Gumbel's resignation but realifize fully the necessity for his doing so. I am glad to see he has agreed to continue as Editor for a period and then as a consulting editor, which arrangement should be intrumental in maintaining the present high standards of the JOURNAL."—C. E. Ramser, Honorary Member, Washington, D. C. Retired.

Iowa Chapter Meeting

The Iowa Chapter held its most successful meeting on October 14 and 15 in the Memorial Union of Iowa State College at Ames. The program arrangements were made by George Johnson, field editor of *Successful Farming*:

Friday, October 14

Greetings and remarks — Art Thoreson, President.

Possible use of subsoiling as a conservation tool—Walter Weiss (SCS, Council Bluffs)

Small grain silage and how it fits the farming program—Howard Hill (Farmer, Minburn)

New ways to renovate brushy pastures—Ralph Krenzin (Iowa State College)

1955 results with new corn growing methods with special comment on soil loss—Orville Hays (USDA, LaCrosse, Wisconsin)

Year-round feeding out of storage, a new way to handle forage—Walter D. Hunnicutt (National Dairy Products Corporation, Columbus, Ohio)

How can watershed programs increase conservation?—Frank Mendell (SCS, Des Moines)

Better use of ACP to speed adoption of conservation practices—Dwight Meyer (ASC, Des Moines)

Use of FHA loans to increase conservation—Kermit Hanson (FHA, Des Moines)

The conservation information program in Pottawattamie County—Russell Swenson (County Extension Director, Oakland)

Integrating the county conservation program—Lewis Culver (Farmer and State Board of District Commissioners, Dunlap, Iowa)

The evening session was as follows:

Russell (First vice president SCSA and farm editor, Des Moines Register and Tribune) presiding.

Presentations:

Wallace Akin (Drake University, Geography Department) Latin America

G. M. Browning (Iowa State College, Associate Director, Agricultural Experiment Station) The United States.

Herb Plambeck (Des Moines radio station WHO Farm Director) Russia.

F. F. Riecken (Iowa State College, Soil Survey) India.

Saturday, October 15

Iowa's supply of underground irrigation water—Tom Thorpe (Thorpe Well Company, Des Moines)

Iowa's supply of surface irrigation water—Dale Hull (Iowa State College)

The place of irrigation in the Midwest as I see it—Gerald Williams (Olin-Mathieson Corp., Little Rock, Arkansas, recently with Purdue University)

Our experience with gated pipe irrigation—Don Anderson (Farmer, Honey Creek)

Irrigation research in Iowa—Bill Shrader (Iowa State College)

Several promising new legume and grass varieties for Iowa—Iver Johnson and staff (Iowa State College)

New crops for conservation—Virgil Hawk (SCS, Plant Materials Specialist)

Developments in water control structures and drainage—Paul Jacobson (Soil Conservation Service, Engineer, State Office)

Coffee and doughnuts were served courtesy of *Successful Farming* and again by Wallace-Homestead Company.

Officers elected for 1956 include George Johnson, president; Joe Colgan, vice president; Cecil Saddoris, secretary, and Louis Thompson, treasurer.

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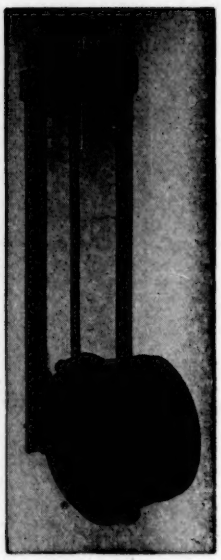

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Virginia

An address on the conservation of our economy and freedom by Dr. Otto Frederikson, professor of History and Social Science at Madison College, highlighted the seventh annual meeting of the Virginia Chapter on September 10. Frederikson pointed out that the free world is in the midst of a battle for supremacy in scientific manpower. He stated that this battle is going against us for Russia has nearly as many engineers and scientists as the United States and is producing new engineers and scientists more than twice as fast as we are. He stated the Soviet has set to work in grim earnest to surpass the United States and the entire free world in highly trained scientific and technological personnel—the key element of technological progress and ultimately in the development of military power.

Other speakers were E. R. Minnich who spoke on the subject of "Farm Planning" and W. E. Cooper who discussed "Plant More Trees."

Hunter Sheppe of Amherst was elected chairman; Jimm Lillard, Blacksburg, vice-chairman; Doc Mann, Gretna, secretary; Terry Hicks, Monterey, and Don Adams, Gloucester, directors.

Wm. Penn

The William Penn Chapter held its annual meeting at the Plaza Inn, Lansdowne, Pennsylvania on November 8. Fred H. Larson reported on the Society's national meeting in Wisconsin. Action was taken to invite the national organization to hold the 1958 annual meeting in Philadelphia.

The chapter also voted to hold a joint meeting with the Keystone Chapter during 1956 and elected Elmer W. Gain as chairman, Gail W. Eley, vice chairman, John E. Clegg, secretary-treasurer.

Robert Struble, staff member of the Brandywine Valley Association, gave an illustrated talk on the watershed work of the Brandywine.

Lincoln

According to word from D. E. Hutchinson, chairman of the Lincoln Chapter, they have set up committees on membership, program, Youth Work for Boy Scouts, 4-H and FFA; a committee on conservation activities in the schools and a national meeting committee. All committees have been organized and are ready to go for 1956.

Washington, D. C., Chapter

"Range Improvement Possibilities in the Western United States" was the topic of Joe F. Pechanec, Chief of the Range Management Research Division of Forest Service, as he spoke to the Washington, D. C., Chapter on December 13. The chapter also held an election of officers on that date but no report has been received.

South Carolina

Chairman J. B. Earle called a meeting of the chapter officers, committee members and several near-by members at Columbia on November 10. The chairmen and officers were all present and plans were made for chapter activity during the coming months. Several suggestions were made to increase the membership and activity of the South Carolina Chapter. Discussion was held about the distribution of the booklet "The Story of Land" and it was pointed out that 14,000 copies had been used in the state about the time school started.

H. Wayne Pritchard, executive secretary, met with the group to tell of the activities of the national organization.

Salina

The Salina Chapter met on October 5 with a total of 54 present. Fred J. Sykes gave the opening remarks while Don Atkins of the Manhattan Chapter reported on the national meeting. D. G. Craig discussed experimental work and stubble mulch farming as he observed it during a recent trip to Canada.

Tom Dicken of Hutchinson was elected chairman for 1956 while Verne Bathurst of McPherson was elected vice chairman; W. L. McFillen of Minneapolis, secretary; John Nelson, Jr., Salina, treasurer; Leslie Johnson, Salina, Kenneth Muse, Marion, and Wilbur Naylor, Concordia, were elected to the chapter council.

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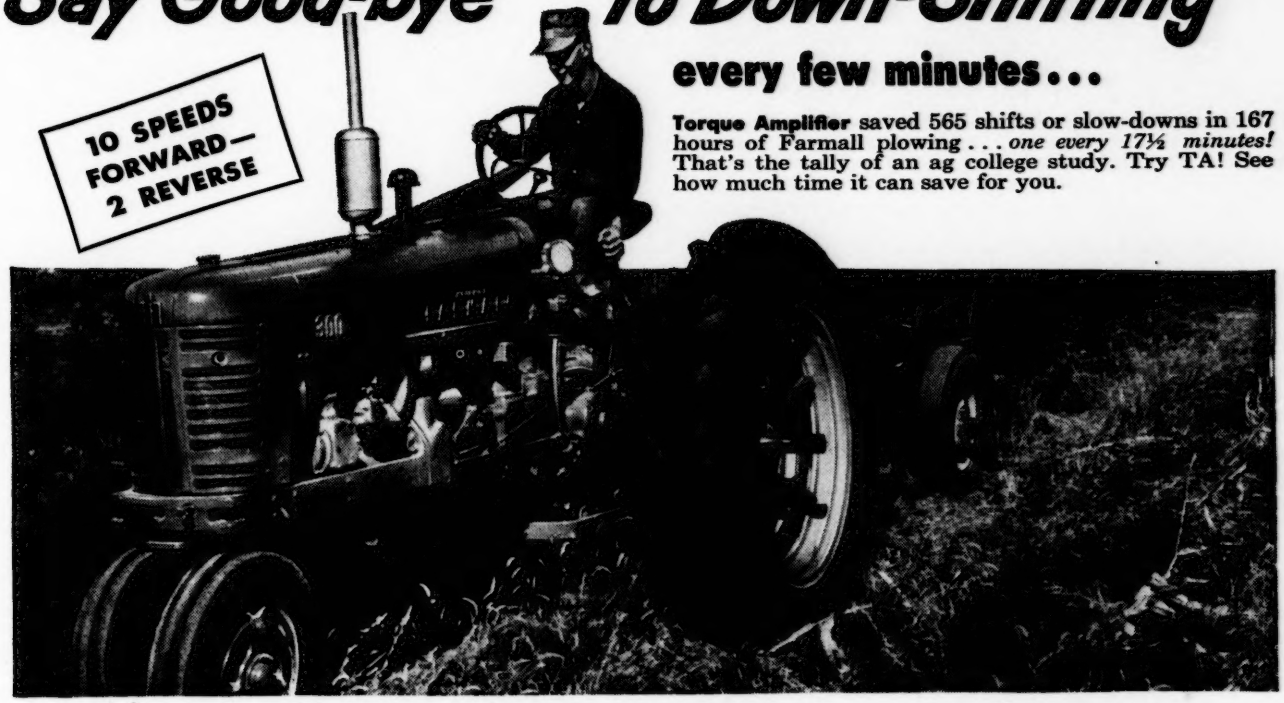

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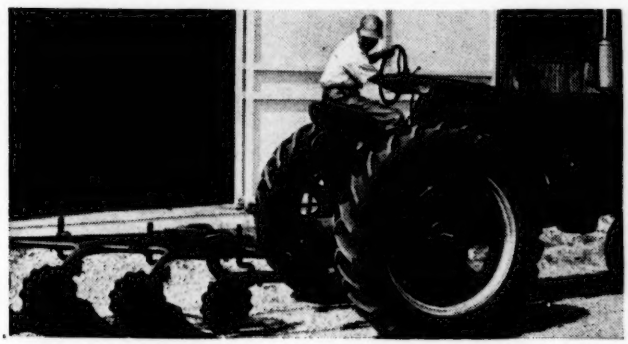
Change speed *instantly* to match power to the load—use TA *all day long* when needed. With Torque Amplifier and *completely* independent pto you can change tractor speed *on-the-go*, keep pto speed constant!



Farmall Fast Hitch lets you Back . . . CLICK! . . . and Go to hitch or switch implements seconds-fast. You save your back . . . speed your farming . . . do top-quality work . . . reduce implement costs.

Farmall Hydra-Touch operates up to three double-acting hydraulic cylinders—one at a time or all together. It gives you the most useful hydraulic implement control ever available in the big tractor field!

Ask your IH dealer to demonstrate exclusive Torque Amplifier on McCormick Farmall and International 300 and 400 Series tractors! Let your Farmall pay for itself in use under the IH Income Purchase Plan of Buying.

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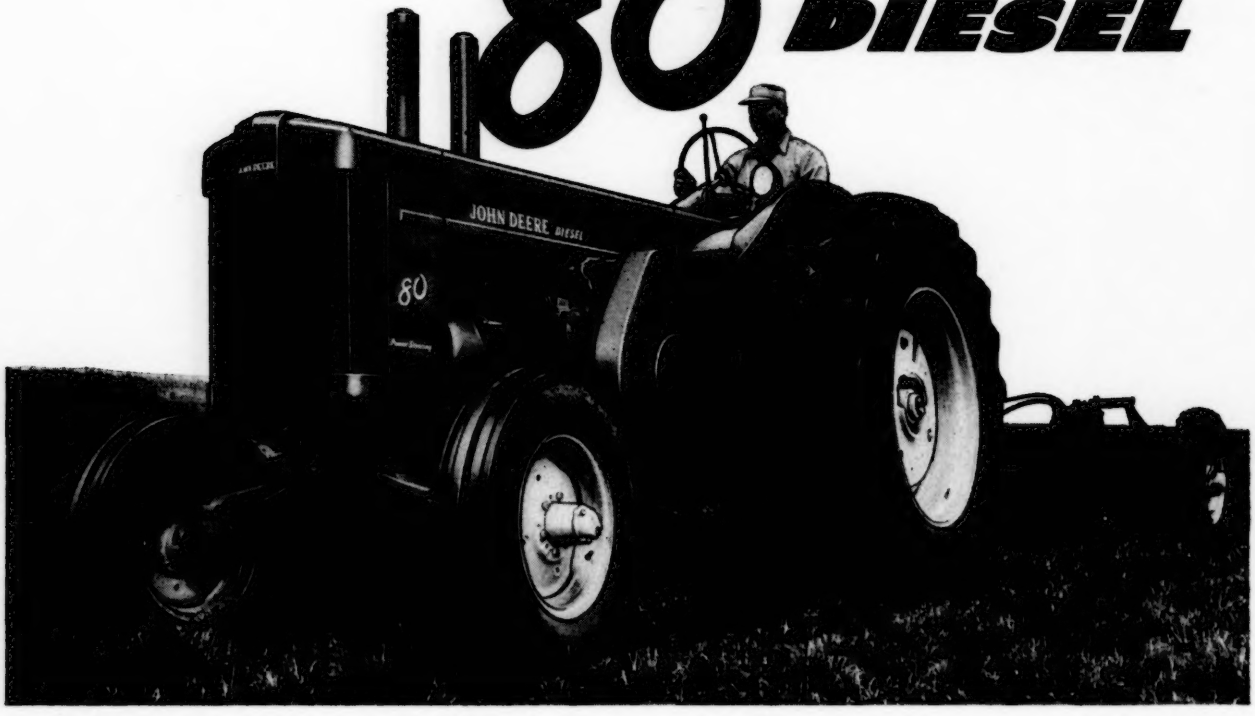
THE *NEW* JOHN DEERE 80 DIESEL



THE EXTRA-QUALITY TRACTOR in the 5-6 Plow FIELD

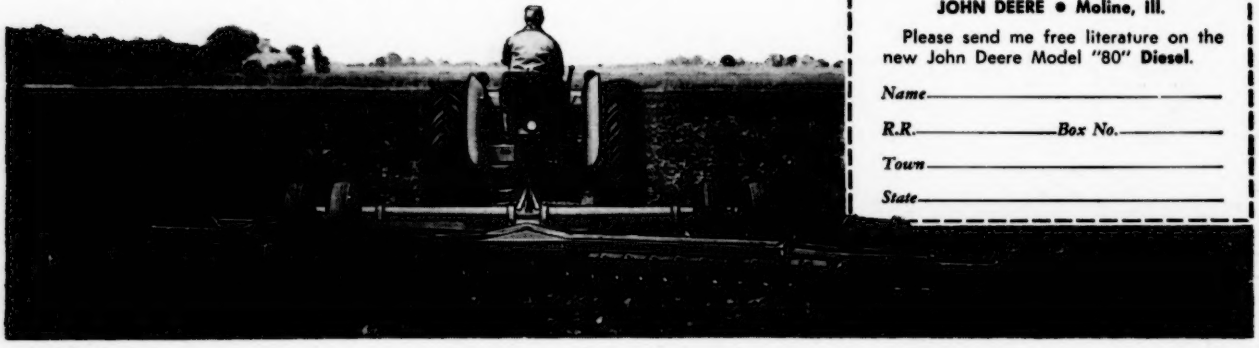
It's a brand-new ultra-modern John Deere Tractor with power* to plow a *six-foot* strip . . . to handle *twenty-one* feet of double-action disk harrow . . . to pull *double* hookups of hydraulically controlled field cultivators, tool carriers, rod weeders, grain drills. Here's capacity that will greatly increase daily work output—that may even save the cost of a second tractor and driver. In addition, the new Model "80" offers amazing fuel economy. In factory tests, it measured up in every way to the championship performance records set by other John Deere Diesel Tractors tested at Lincoln, Nebraska.

Power Steering

John Deere Power Steering offers new freedom from steering effort and driver fatigue. It's another outstanding feature available on the Model "80" Diesel.

**Factory tests show approximately 65 h.p. on the belt; 57 on the drawbar.*

Here's big capacity shown in action below. It's the new John Deere Model "80" *Diesel* disking a 21-foot swath with the new Model "FW" Disk Harrow. With capacity like this, your big jobs get done in a hurry at lower cost.



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